

PERSONAL INFORMATION

Massimiliano Vasile



 <https://www.strath.ac.uk/staff/vasilemassimilianoprof/>

Sex \*\*\*\* | Date of birth \*\*\*\*\* | Nationality \*\*\*\*

WORK EXPERIENCE

<ul style="list-style-type: none"> <li>• Dates (from – to)</li> <li>• Name and address of employer</li> <li>• Type of business or sector</li> <li>• Occupation or position held</li> <li>• Main activities and responsibilities</li> </ul>	<p><b>AUGUST 2013- CURRENT</b>                  Department of Mechanical Engineering, University of Strathclyde, James Weir Building, G1 1XJ, Glasgow, UK                  Education and Research                  FULL PROFESSOR                  TEACHING ACTIVITIES                  Course leader of the course of Space Flight Mechanics.                  ADMINISTRATIVE DUTIES                  DIRECTOR OF RESEARCH                  DIRECTOR OF THE AEROSPACE CENTRE OF EXCELLENCE                  COORDINATOR OF THE OCEAN, AIR AND SPACE UNIVERSITY THEME                  CO-DIRECTOR OF THE SPACE CLUSTER</p> <p>RESEARCH ACTIVITIES                  Research activities are mainly devoted to advanced studies and developments in the fields of optimization and uncertainty quantification for complex engineering systems, computational intelligence applied to astrodynamics and space systems engineering. A more detailed description of my research activities can be found below.</p>
<ul style="list-style-type: none"> <li>• Dates (from – to)</li> <li>• Name and address of employer</li> <li>• Type of business or sector</li> <li>• Occupation or position held</li> <li>• Main activities and responsibilities</li> </ul>	<p><b>OCTOBER 2010- AUGUST 2010</b>                  Department of Mechanical Engineering, University of Strathclyde, James Weir Building, G1 1XJ, Glasgow, UK                  Education and Research                  Reader  <b>Teaching Activities</b>                  Course leader of the course of Space Flight Mechanics.</p> <p><b>Research Activities</b>                  Research activities are mainly devoted to advanced studies and developments in the fields of optimization for aerospace systems, mission analysis and design and autonomy. A more detailed description of my research activities can be found below.</p>
<ul style="list-style-type: none"> <li>• Dates (from – to)</li> <li>• Name and address of employer</li> <li>• Type of business or sector</li> <li>• Occupation or position held</li> <li>• Main activities and responsibilities</li> </ul>	<p><b>AUGUST 2008– OCTOBER 2010</b>                  Department of Aerospace Engineering, University of Glasgow, James Watt South Building, G12 8QQ, Glasgow, UK                  Education and Research                  Senior Lecturer  <b>Teaching Activities</b>                  Lecturer of Space System Engineering.</p> <p><b>Research Activities</b></p>

- Dates (from – to)
- Name and address of employer
- Type of business or sector
- Occupation or position held
- Main activities and responsibilities

Research activities are mainly devoted to advanced studies and developments in the fields of mission analysis and design and autonomy for space applications. A more detailed description of my research activities can be found below.

**AUGUST 2005 – AUGUST 2008**

Department of Aerospace Engineering, University of Glasgow, James Watt South Building, G12 8QQ, Glasgow, UK

Education and Research

Lecturer

**Teaching Activities**

Lecturer of Space System Engineering.

**Research Activities**

Research activities are mainly devoted to advanced studies and developments in the fields of mission analysis and design and autonomy for space applications. A more detailed description of my research activities can be found below.

- Dates (from – to)
- Name and address of employer
- Type of business or sector
- Occupation or position held
- Main activities and responsibilities

**JANUARY 2004 – AUGUST 2005**

Department of Aerospace Engineering, Politecnico di Milano, via La Masa 34, 20156Milano Italy

Education and Research

Lecturer

**Teaching Activities**

Lecturer of Space System Design course. In charge of organizing and delivering the course of Space System Design since January 2004. The course consists of a number of lectures covering all aspects related to the design of a space mission and to the design of all spacecraft subsystems. The course aims at training the students on realistic pre-feasibility studies of possible space missions. As course leader I have to define the objectives and requirements of three different mission scenarios, deliver the related lectures and support the development of the pre-feasibility studies. In this context I am often playing the role of principle investigator or team leader.

In March 2005 I will be delivering, as a visiting professor, the Spacecraft Systems II course to students of the Space Mission Analysis and Design MSc degree at the University of Glasgow. Additional duties include setting the exam paper for the course.

As part of my teaching activities I am currently supervising a number of students working on their final thesis and 2 Ph.D. students.

In 2004 I supervised an Erasmus student, Ross Hilditch, from Glasgow University who worked on the thesis project: *Monographic Optical Docking System*

**Research Activities**

My research activities are mainly devoted to advanced studies and developments in the fields of mission analysis and design and autonomy for space applications. A more detailed description of my research activities can be found below.

- Dates (from – to)
- Name and address of employer
- Type of business or sector
- Occupation or position held
- Main activities and responsibilities

November 2001- December 2003

ESA/ESTEC, Keplerlaan 1, Postbus 299,2200 AG Noordwijk, The Netherlands

Aerospace Research and Developments

Research Fellow

I was the first member of the Advanced Concepts Team (ACT). My principal duty was to deal with all Mission Analysis and Design issues and research. I had to study and develop advanced tools for mission analysis and design, new methodologies and approaches and produce a document to restructure the way of performing mission analysis in ESA on the basis of what was done in the rest of the world.

In 2002 I organized an international workshop on trajectory optimization and optimization techniques involving a number of specialists from two different fields: pure optimization and space trajectory design.

As a secondary duty I had to support the activities of other ESA sections. I gave support to the Aurora program for the analysis of launch opportunities to and from Mars, I revised the studies coming from ESOC and participated in the analysis of the trajectories for Mars Exobiology with electric propulsion in collaboration with the

propulsion section at ESTEC.

I was involved in the Bepicolombo study (I am still giving support to ESOC for the optimization of advanced trajectories to Mercury).

As part of my duty I had to propose studies in the framework of the ESA General Study Program. I proposed three studies: Advanced Global Optimisation Tools for Mission Analysis and Design, Mime Nature for Hibernation of Astronauts During Long Space Travels, Multidisciplinary Optimisation in Mission Analysis and Design Process.

The first two became later two Ariadna studies awarded respectively to Glasgow University and Reading University the first one and to the University of Verona the second one. The third contract was given to Alenia Spazio in 2003.

In the early stages of the ACT's life I contributed to the definition of the Ariadna program, the research topics and team composition and recruitment philosophy.

In the framework of Ariadna I proposed two studies: Assesment of mission design including utilization of libration points and weak stability boundaries, study on libration points of the sun and the interstellar medium for interstellar travels. The former awarded to the University of Barcellona and to the Politecnico di Milano the latter to Glasgow University and to the University of Padua.

In the period at ESTEC I supervised 5 students working on their master thesis: three of them were from Politecnico di Milano and two of them were from the University of Liegi.

The thesis subjects were:

- 'Optimisation and Design of a Mission to Europa with Solar Electric Propulsion and Multiple Gravity Assist Manoeuvres' (Milan)
- 'Global Design Tools for Preliminary Design of Interplanetary Trajectories' (Milan)
- 'A Robust Approach to the Design of Earth-Mars Abort Options' (Milan)
- 'Comparison Between Cyclers and Stop-over Cyclers for a Regular Earth-Mars Transportation System'(Liegi)
- 'Probabilistic Optimisation Applied to Spacecraft Rendezvous on Keplerian Orbits'(Liegi)

<ul style="list-style-type: none"> <li>• Dates (from – to)</li> <li>• Name and address of employer</li> <li>• Type of business or sector</li> <li>• Occupation or position held               <ul style="list-style-type: none"> <li>• Main activities and responsibilities</li> </ul> </li> </ul>	<p>November 2001- December 2003</p> <p>Department of Aerospace Engineering, Politecnico di Milano via La Masa 34, 20156Milano Italy</p> <p>Education and Research</p> <p>Visiting Professor</p> <p>Visiting professor forSpace System Design course. During my period at ESTEC I was in charge of organizing and delivering the course lectures of Space System Design from 2001 to 2003.</p>
<ul style="list-style-type: none"> <li>• Dates (from – to)</li> <li>• Name and address of employer</li> <li>• Type of business or sector</li> <li>• Occupation or position held               <ul style="list-style-type: none"> <li>• Main activities and responsibilities</li> </ul> </li> </ul>	<p>January 2000-November 2001</p> <p>Department of Aerospace Engineering, Politecnico di Milano via La Masa 34, 20156Milano Italy</p> <p>Education and Research</p> <p>Technical Project Manager</p> <p>Thanks to the activity performed during the stage at ESOC, a contract was awarded to the Department of Aerospace Engineering for the development of a software tool for the design of interplanetary and lunar trajectories with low-thrust and multiple gravity assist manoeuvres.</p> <p>The ESA/ESOC contract 14126/00/D/CS was awarded in January 2000 and continued until December 2001. The software was first developed and then tested using three real mission case studies: Bepicolombo, SOLO, SMART-1. I was responsible for all technical aspects of the development and for the practical implementation of the whole software apart from the graphical user interface.</p>

## EDUCATION AND TRAINING

<ul style="list-style-type: none"> <li>•Dates (from-to)</li> <li>• Name and type of organization providing education and training</li> <li>• Principal subjects/occupational skills covered</li> </ul>	<p>November 1998-November 2000</p> <p>Department of Aerospace Engineering, Politecnico di Milano, via La Masa 34, 20156Milano Italy</p> <p>The PhD work was mainly focused on trajectory design and optimization with direct techniques. Two basic areas were studied: direct collocation and local NLP sparse solvers, direct multiple shooting and global hybrid evolutionary algorithms.</p>
--	---

In the framework of the first is the development of the innovative technique of Direct Finite Element Transcription (DFET) which has been applied to the solution of several typical problems in space mission analysis and design. The approach has been extended to the treatment of problems with multiple phases (in parallel or sequential) with one or more objectives. The most challenging problems solved during the PhD were the Bepicolombo, the SOLO and the SMART-1 missions.

Hybrid EAs were applied to the solution of Weak Stability Transfers to the Moon. The EAs were hybridized with a local SQP search.

The thesis title is: *Optimal Trajectory Design for Interplanetary Spaceflights*

The research on DFET has led to the development of the software DITAN under ESA contract. This has required some advanced programming skills in Fortran 77 and Matlab.

In parallel with the research on optimization methods for trajectory design, a significant amount of work has been done on strategies and algorithms for autonomy in space.

In particular research in this field have been split into three main areas:

- autonomy for deep space navigation
- autonomy for close approach, rendezvous and landing
- autonomy for local mobility

<ul style="list-style-type: none"> <li>• Title of qualification awarded</li> <li>• Level in national classification (if appropriate)</li> </ul>	<p>PhD in Aerospace Engineering</p> <p>N/A</p>
<ul style="list-style-type: none"> <li>• Dates (from-to)</li> <li>• Name and type of organization providing education and training</li> <li>• Principal subjects/occupational skills covered</li> </ul>	<p>September 1999-December 1999</p> <p>ESA/ESOC, Robert-Bosch-Str. 5, 64293 Darmstadt Germany</p> <p>During this training period (occurred during the PhD course as part of the PhD activities) the main subject was the design of interplanetary trajectories for spacecraft equipped with low-thrust engines. The main case study was the mission LISA.</p> <p>Additional studies were performed on the landing sequence for Bepicolombo.</p>
<ul style="list-style-type: none"> <li>• Title of qualification awarded</li> <li>• Level in national classification (if appropriate)</li> </ul>	<p>Stage</p> <p>N/A</p>
<ul style="list-style-type: none"> <li>• Dates(from-to)</li> <li>• Name and type of organization providing education and training</li> <li>• Principal subjects/occupational skills covered</li> </ul>	<p>October 1989-October 1996</p> <p>Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133, Milano, Italy</p> <p>The Aerospace Engineering Master Degree was a five year course. During the first two years I had basic courses in Mathematics, Physics, Chemistry, Calculus, Numerical Analysis.</p> <p>The last three years I had courses related to Aeronautics and Space topics: Space Flight Mechanics, Space Propulsion, Attitude Control, Orbit Mechanics.</p> <p>The final thesis was on the analysis of stable periodic orbits around the Moon subject to an inhomogeneous gravity field. In particular analytical and numerical solutions for frozen orbit were studied and a method based on finite elements in time were developed for the design of periodic and quasi-periodic solutions.</p> <p>The thesis title was: 'Numerical Approach for the design of Lunar Periodic and Frozen Orbits'. Supervisor Prof. Amalia Finzi</p>
<ul style="list-style-type: none"> <li>• Title of qualification awarded</li> <li>• Level in national classification</li> </ul>	<p>Graduation. Master Degree in Aerospace Engineering</p> <p>94/100</p>
<ul style="list-style-type: none"> <li>• Dates (from-to)</li> <li>• Name and type of organization providing education and training</li> <li>• Principal subjects/occupational skills covered</li> </ul>	<p>August 1995</p> <p>ESA/ESTEC, , Keplerlaan 1, Postbus 299,2200 AG Noordwijk, The Netherlands</p> <p>Winner of the Euroavia European design contest for the design of a small mission to the Moon. 25 students were selected from all over Europe for a 1 month design workshop held at ESTEC. During the workshop we had to design, in a concurrent like fashion, a low-cost mission to the Moon.</p>

- Title of qualification awarded      Design Contest
- Level in national classification      -  
(if appropriate)
- Dates(from-to)                          September 1984-August 1989
- Name and type of organization        Collegio San Carlo, Milano, Corso Magenta 71, 20123 Milano, Italy  
providing education and training
- Principal subjects/occupational      High school diploma. The main subject were:  
skills covered                              - mathematics & physics  
   - chemistry& biology  
   - Latin  
   - Italian literature  
   - history and philosophy  
   - arts
- Title of qualification awarded        Scientific Diploma (Diploma di Maturità Scientifica)
- Level in national classification        57/60  
(if appropriate)

**PERSONAL SKILLS**

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Replace with name of language certificate. Enter level if known.					
Spanish	A1	A1	A1	A1	A1
Replace with name of language certificate. Enter level if known.					

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
Common European Framework of Reference for Languages

Communication skills      Good communication skills gained through my experience as lecturer and the multiple seminars and presentations at international conferences

Organisational / managerial skills      ▪ Leadership and organisational skills – currently director of the Aerospace Centre of Excellence counting 12 staff and over 30 researchers.

Job-related skills      ▪ Leadership and organisation skills – coordinator of 3 MSCA ETNs, currently coordinating the Stardust-Reloaded network counting 12 beneficiaries and 24 partners worldwide  
 ▪ Good knowledge of the space sector and of the funding landscape in Europe and worldwide  
 ▪ Very good knowledge of funding opportunities and funding schemes in Europe, including application procedures and selection processes.  
 ▪ Long experience with successful grant proposal writing and management of funded research projects  
 ▪ Long term multidisciplinary research and development planning through my experience as Director of Research of the Department of Mechanical and Aerospace Engineering counting 4 research centre including space/aerospace, energy, fluids and materials.  
 ▪ Good experience of education and training activities from undergraduate student level to continuous professional development level, through my experience as academic, the coordination of the three ETNs and the organisation of Continuous Professional Development courses for industry.  
 ▪ Good experience of setting the national agenda and long term definition of national strategies through my role of scientific adviser for the UK Space Agency and within the Scottish Space Leadership Council.

Computer skills      Good knowledge of Matlab, and basic knowledge of Julia and Python. Good command of Microsoft Office™ tools, Linux and latex.

Driving licence    Driving licence category B

ADDITIONAL INFORMATION

---

## PUBLICATIONS

## Magazines

Vasile, M 2017, 'Optimising resilience: at the edge of computability' Mathematics Today, vol 53, no. 5, pp. 231-234..

## Editorials

Vasile, M. Computational Intelligence in Aerospace Science and Engineering, CIS Magazine, November 2017.

## Books

Vasile M., Becerra V. Computational Intelligence in Aerospace Sciences. AIAA, 2014 eISBN: 978-1-62410-260-8, DOI: 10.2514/4.102608.

Vasile M., Minisci, E., Asteroid and Space Debris Manipulation: Advances from the Stardust Research Network. AIAA 2016, ISBN: 978-1-62410-323-0, eISBN: 978-1-62410-324-7.

Vasile, M., Minisci, E., Summerer, L., Mcginty, P. Stardust Final Conference. Advances in Asteroids and Space Debris Engineering and Science. Springer ISBN 978-3-319-69956-1.

Vasile, M. Optimization Under Uncertainty with Applications to Aerospace Engineering, Springer, 2021, ISBN 978-3-030-60166-9.

## Book Chapters

1. Vasile M., Ceriotti M. *Incremental Techniques for Global Space Trajectory Design. Space Trajectory Optimization.* Cambridge University Press, 2010. ISBN 113949077X, 9781139490771 .
2. Vasile M., Croisard N. *Robust Preliminary Space Mission Design Under Uncertainty* Computational Intelligence in Expensive Optimization Problems, Springer-Verlag in the series Studies in Evolutionary Learning and Optimization, Tenne, Yoel; Goh, Chi-Keong (Eds.) 1st Edition., 2010, ISBN: 978-3-642-10700-.
3. Vasile M., Ceriotti M., *Automatic Goal Allocation for a Planetary Rover with DSMT.* Advances and Applications of DSMT for Information Fusion. American Research Press Rehoboth, 2009, ISBN-10: 1-59973-073-1.
4. Vasile M., *Hybrid Behavioural-Based Multiobjective Space Trajectory Optimization.* on Multi-Objective Memetic Algorithms, Springer Series of Studies in Computational Intelligence, Series: Studies in Computational Intelligence , Vol. 171, Goh, Chi-Keong; Ong, Yew-Soon; Tan, Kay Chen (Eds.) 2009, XII, 404 p. 227 illus., Hardcover, ISBN: 978-3-540-88050-9.
5. Vasile M. Bernelli-Zazzera F. *Targeting a Heliocentric Orbit Combining Low-Thrust Propulsion and Gravity Assist Manoeuvres.* Operational Research in Space & Air, vol. 79 ISBN 1-4020-1218-7 Book Series in Applied Optimization Kluwer Academy Press 2003
6. Vasile M. *Combining Evolution Programs and Gradient Methods for WSB Transfer Optimisation.* Operational Research in Space & Air, vol. 79 ISBN 1-4020-1218-7 Book Series in Applied Optimization Kluwer Academy Press 2003

## Refereed Proceedings

1. Gentile L., Greco C., Minisci E., Bartz-Beielstein T., Vasile M. Structured-chromosome GA optimisation for satellite tracking, Genetic and Evolutionary Computation Conference Companion (GECCO) 2019 (2019).
2. Ricciardi L. A, Vasile M., Solving multi-objective dynamic travelling salesman problems by relaxation, GECCO '19 Proceedings of the Genetic and Evolutionary Computation Conference Companion GECCO 2019, pp. 1999-2007 (2019), <https://doi.org/10.1145/3319619.3326837>.
3. Vasile, M. (2019). Polynomial representation of model uncertainty in dynamical systems. In Advances in Evolutionary and Deterministic Methods for Design, Optimization and Control in Engineering and Sciences: Computational Methods in Applied Sciences (pp. 419-432). (Computational Methods in Applied Sciences; Vol. 48). Springer. [https://doi.org/10.1007/978-3-319-89988-6\\_25](https://doi.org/10.1007/978-3-319-89988-6_25)
4. Ricciardi, L. A., & Vasile, M. (2019). Improved archiving and search strategies for multi agent collaborative search. In Advances in Evolutionary and Deterministic Methods for Design, Optimization and Control in Engineering and Sciences: Computational Methods in Applied Sciences (pp. 435-455). (Computational

- Methods in Applied Sciences; Vol. 48). Springer. [https://doi.org/10.1007/978-3-319-89988-6\\_26](https://doi.org/10.1007/978-3-319-89988-6_26).
5. Greco C., Gentile L., Filippi G., Minisci E. Vasile M., Bartz-Beielstein T., Autonomous generation of observation schedules for tracking satellites with structured-chromosome GA optimization, 2019 IEEE Congress on Evolutionary Computation 2019 IEEE Congress on Evolutionary Computation, pp. 497-505 (2019) – best student paper runner-up. <https://doi.org/10.1109/CEC.2019.8790101>
  6. Filippi G., Vasile M., A memetic approach to the solution of constrained min-max problems, 2019 IEEE Congress on Evolutionary Computation (2019)
  7. Filippi G., Vasile M., Marchi M., Vercesi P.. Evidence-based robust optimisation of space systems with evidence network models, IEEE world congress on computational intelligence , pp. 1-8 (2018).
  8. Schuetze O., Lara A., Coello Coello C.A., Vasile M. *Computing Approximated Solutions of Scalar Optimization Problems and Applications in Space Mission Design*. IEEE WCCI 2010, Barcelona, 17-23 July 2010.
  9. Vasile M., Zuiani F., *A Hybrid Multiobjective Optimization Algorithm Applied to Space Trajectory Optimization*. IEEE WCCI 2010, Barcelona, 17-23 July 2010.
  10. Ceriotti M., Vasile M., *An Ant System Algorithm for Automated Trajectory Planning*. IEEE WCCI 2010, Barcelona, 17-23 July 2010.
  11. Vasile M., Minisci E. *Memetic Strategies for Global Trajectory Optimisation*. 4th International Symposium on Intelligence Computation and Applications ( ISICA 2009), 23-25 October 2009, Huangshi, China.
  12. Vasile M., Maddock C., Summerer L., *Conceptual Design of a Multi-Mirror System for Asteroid Deflection*. 27th International Symposium on Space Technology and Science, 5-12 July 2009, Tsukuba, Japan.
  13. Novak D., Vasile M., *Optimal Preliminary Design of Low-Thrust Trajectories Through Two Novel Shaping Approaches*. 27th International Symposium on Space Technology and Science, 5-12 July 2009, Tsukuba, Japan.
  14. Vasile M., Minisci E., Locatelli M. *A Dynamical System Perspective on Evolutionary Heuristics Applied to Space Trajectory Optimization Problems*. IEEE Congress on Evolutionary Computation 2009, 18<sup>th</sup>-21<sup>st</sup> May, 2009, Trondheim, Norway.
  15. Croisard N., Vasile M., *System Engineering Design Optimisation Under Uncertainty for Preliminary Space Mission*. IEEE Congress on Evolutionary Computation 2009, 18<sup>th</sup>-21<sup>st</sup> May, 2009, Trondheim, Norway.
  16. Schütze O., Vasile M., Coello Coello C.A., *Approximate Solutions in Space Mission Design*. Volume 5199/2008, Parallel Problem Solving from Nature – PPSN X. Lecture Notes in Computer Science, Springer 2008.
  17. Vasile M., *A Behavior-based Meta-Heuristic for Robust Global Trajectory Optimization*, IEEE Congress on Evolutionary Computing, Singapore, September 2007.
  18. Maddock C., Vasile M., *Optimal Design for a NEO Tracking Spacecraft Formation*, IEEE Congress on Evolutionary Computing, Singapore, September 2007.
  19. Carnelli I., Dachwald B., Vasile M., *Optimizing Low-Thrust Gravity Assist Interplanetary Trajectories*. IEEE Congress on Evolutionary Computing, Singapore, September 2007
  20. Maddock C., Sanchez Curtielles J.P., Vasile M., Radice G. *Comparison of Single and Multi-spacecraft Configurations for NEA Deflection by Solar Sublimation*. American Institute of Physics Conference Proceedings 886,pp.303-316, 2007.
  21. Sanchez Cuartielles J.P., Colombo C., Vasile M., Radice G. *A Multi-Criteria Assessment of Deflection Methods for Dangerous NEOs*. American Institute of Physics Conference Proceedings 886,pp.317-334, 2007.
  22. Topputo F., Vasile M., Bernelli-Zazzera F., *Earth-to-Moon Low Energy Transfers Targeting L1 Hyperbolic Transit Orbits*, Annals of the New York Academy of Sciences, Vol 1065: pp 55-76, December 2005.
  23. Vasile M., *Robust Mission Design Through Evidence Theory and Multiagent Collaborative Search*. Annals of the New York Academy of Sciences, Vol 1065: pp. 152-173, December 2005.
  24. Vasile M. *A Systematic-Heuristic Approach for Space Trajectory Design*. Astrodynamics, Space Missions and Chaos, Ann NY Acad Sci 2004 Vol. 1017:234-254
  25. Vasile M., Summerer L., Linder N., Saive G. *Advanced Trajectory Options for the Exploration of the Pluto-Charon System*. ISTS 2004-d-49.24th ISTS, May 30,6



June, 2004

26. Summerer L., Vasile M., Ongaro F. *Assessment of an integrated space-terrestrial, solar-based Euro-Asian energy system.* 24th ISTS, May 30,6 June, 2004

#### Journals

1. Wilson, A.R., Vasile, M., Maddock, C., Baker, K. *Implementing Life Cycle Sustainability Assessment for Improved Space Mission Design.* Integrated Environmental Assessment and Management. 2022. Accepted in press.
2. Wilson, A. R., Vasile, M. *Life Cycle Engineering of Space Systems: Preliminary Findings,* Advances in Space Research, accepted in press, 2022
3. Vasile, M., Manzi, M., *Polynomial Stochastic Dynamical Indicators,* Celestial Mechanics and Dynamical Astronomy, accepted in press 2022.
4. Fodde, I., Feng, J., Riccardi, A., Vasile, M. *Robust Stability and Mission Performance of a CubeSat Orbiting the Didymos Binary Asteroid System.* Acta Astronautica, accepted in press, 2022.
5. Vasile, M., Walker, L., Dunphy, R.D., Zabalza, J., Murray, P., Marshall, S., Savitski, V. *Intelligent Characterisation of Space Objects with Hyperspectral Imaging,* Acta Astronautica, 2022.
6. Wilson, A. R., Serrano, S. M., Baker, K. J., Oqab, H. B., Dietrich, G. B., Vasile, M., Soares, T., & Innocenti, L. (2022). *From life cycle assessment of space systems to environmental communication and reporting.* Journal of the British Interplanetary Society, 75(9), 321-336.
7. Sanchez L., Vasile, M. *Intelligent Decision Support for Collision Avoidance Manoeuvre Planning Under Uncertainty.* Advances in Space Research, 20 September 2022, <https://doi.org/10.1016/j.asr.2022.09.023>.
8. Wang, Y., and Vasile, M. (2022). *Intelligent selection of NEO deflection strategies under uncertainty.* Advances in Space Research. <https://doi.org/10.1016/j.asr.2022.08.086>.
9. Fodde, I., Feng, J., Vasile, M. *Uncertainty Maps for Motion Around Binary Asteroids.* Celestial Mechanics and Dynamical Astronomy, 134, Article number: 41 (2022).
10. Wilson, A.R., Vasile, M., Maddock, C.A., Baker, K.J., *Ecospheric life cycle impacts of annual global space activities,* Science of The Total Environment, Volume 834, 2022, 155305, ISSN 0048-9697, <https://doi.org/10.1016/j.scitotenv.2022.155305>.
11. Greco, C., Campagnola, S., Vasile, M. *Robust Space Trajectory Design using Belief Optimal Control.* AIAA Journal of Guidance, Control and Dynamics, 2022, Vol 45, No 6, June 2022.
12. Celletti, A., Rodriguez-Fernandez V., Gales, C., Vasile, M. *Classification of Regular and Chaotic Motions in Hamiltonian systems with Deep Learning,* Scientific Reports, 2022.
13. Yang, B., Li, S., Feng, J., Vasile, M. *Fast solver for J2-perturbed Lambert problem using deep neural network.* AIAA Journal of Guidance, Control and Dynamics, 20 Dec 2021 <https://doi.org/10.2514/1.G006091>.
14. Gentile, L., Greco, C., Minisci, E., Bartz-Beielstein, T., Vasile, M. *Stochastic Satellite Tracking with Constrained Budget via Structured-Chromosome Genetic Algorithms,* Optimization and Engineering, November 2021, <https://doi.org/10.1007/s11081-021-09693-1>.
15. Ricciardi, L. A., Maddock, C. A. & Vasile, M. *Multi-objective optimisation under uncertainty with unscented temporal finite elements.* 24 Nov 2021, In: Mathematics. 9, 23, 22 p., 3010.
16. Marto, S., Vasile, M. *Multi-Objective Robust Trajectory Optimisation Under Epistemic Uncertainty and Imprecision.* Acta Astronautica Available online 30 October 2021. <https://doi.org/10.1016/j.actaastro.2021.10.022>.
17. Greco, C., Vasile, M. *Robust Bayesian Particle Filter for Space Object Tracking Under Severe Uncertainty.* AIAA Journal of Guidance, Control and Dynamics, 2021, Vol 45 No 3, March 2022.
18. Di Carlo M., Vasile, M., *Analytical Solutions for Low-Thrust Orbit Transfers.* Celestial Mechanics and Dynamical Astronomy, 133, 33 (2021). <https://doi.org/10.1007/s10569-021-10033-9>.
19. Filippi, G., Vasile, M. *Global Solution of Constrained Min-Max Problems with Inflationary Differential Evolution.* Optimization and Engineering, (2021). <https://doi.org/10.1007/s11081-021-09613-3>.
20. Di Carlo, M., Marto, S., Vasile, M. *Extended Analytical Formulae for the Perturbed Keplerian Motion Under Low-Thrust Acceleration and Orbital Perturbations,* Celestial Mechanics and Dynamical Astronomy, 133, 13 (2021).

- <https://doi.org/10.1007/s10569-021-10007-x>.
21. Walker, L., Di Carlo, M., Greco, C., Vasile, M. *A Mission Concept for the Low-Cost Large-Scale Exploration and Characterisation of Near Earth Objects*, *Advances in Space Research*, Volume 67, Issue 11, 2021, Pages 3880-3908, ISSN 0273-1177, <https://doi.org/10.1016/j.asr.2020.10.038>.
  22. Tardioli, C., Farnocchia, D., Vasile, M. *Impact Probability Under Aleatory and Epistemic Uncertainties*, *Celestial Mechanics and Dynamical Astronomy*, 132, 54 (2020). <https://doi.org/10.1007/s10569-020-09991-3>.
  23. Sanchez Fernandez-Mellado, L. & Vasile, M., *On the use of machine learning and evidence theory to improve collision risk management*, 31 Jul 2020, *Acta Astronautica*, ISSN 0094-5765, <https://doi.org/10.1016/j.actaastro.2020.08.004>.
  24. Torre, F., Vasile, M. & Grey, S., *Angles-only navigation in the proximity of a binary asteroid system*, *AIAA Journal of Guidance, Control and Dynamics*, Volume 44, Number 1 January 2021, Published Online: 2 Sep 2020 <https://doi.org/10.2514/1.G004355>.
  25. S. Neda Naghshbandi ; Liz Varga ; Alan Purvis ; Richard McWilliam ; Edmondo Minisci ; Massimiliano Vasile, Matthias Troffaes, Tabassom Sedighi, Weisi Guo, Ed Manley, David H. Jones.. *A review of methods to study resilience of complex engineering and engineered systems*, in *IEEE Access*, 2020, doi: 10.1109/ACCESS.2020.2992239.
  26. Theodorou, C Ilioudis, C Clemente, M Vasile, J Soraghan, *SISAR imaging for space debris based on nanosatellites*. *IET Radar Sonar and Navigation*, 2020.
  27. Punzo, G., Tewari, A., Butans, E., Vasile, M., Purvis, A., Mayfield, M., and Varga, L. *Engineering Resilient Complex Systems: the Necessary Shift toward Complexity Science*, *IEEE System Journal*, 2019.
  28. Greco, C., Vasile, M., Di Carlo, M., Epenoy, R. *Direct Multiple Shooting Transcription with Polynomial Algebra for Optimal Control Problems Under Uncertainty*. *Acta Astronautica*, 2019, <https://doi.org/10.1016/j.actaastro.2019.12.010>.
  29. Filippi, G., Vasile, M., Korondi, Z., Krpelik, D., Marchi, M., Poloni, M. *Space Systems Resilience Optimisation Under Epistemic Uncertainty*. *Acta Astronautica*, 2019, ISSN 0094-5765, <https://doi.org/10.1016/j.actaastro.2019.08.024>.
  30. Di Carlo M., Vasile M., Minisci, E. *Adaptive Multi-Population Inflationary Differential Evolution*. *Soft Computing*, 2019, <https://doi.org/10.1007/s00500-019-04154-5>.
  31. Vasile M., Ortega, C., Riccardi A. *Set propagation in dynamical systems with generalised polynomial algebra and its computational complexity*. *Communications in Nonlinear Science and Numerical Simulation* Volume 75, August 2019, Pages 22-49. <https://doi.org/10.1016/j.cnsns.2019.03.019>.
  32. Ricciardi, L., Maddock, C., Vasile, M. *Direct Solution of Multi-Objective Optimal Control Problems Applied to Spaceplane Mission Design*. *AIAA Journal of Guidance Control and Dynamics*, 2018, <https://doi.org/10.2514/1.G003839>.
  33. Ricciardi, L., Vasile, M. *Direct Transcription of Optimal Control Problems with Finite Elements on Bernstein Basis* *AIAA Journal of Guidance Control and Dynamics*, 2018, <https://doi.org/10.2514/1.G003753>.
  34. Persico, A., Clemente, C. Vasile, M.; Kirkland, P. Soraghan, J. *Cubesat-based Bistatic Passive Radar for Space Situational Awareness: a Feasibility Study*. *IEEE Transactions on Aerospace Engineering and Systems*, 18 June 2018, 10.1109/TAES.2018.2848340.
  35. Serra, R., Vasile, M., Hoshi, K., Yamakawa, H. *Study of the Lorentz force on debris with high area-to-mass ratios*. *AIAA Journal of Guidance Control and Dynamics*, Vol. 41, No. 8 (2018), pp. 1675-1686. <https://doi.org/10.2514/1.G003317>.
  36. Vasile, M., Torre, F. , Serra, R., Grey, S. *Autonomous Orbit Determination for Formations of Cubesats Beyond LEO*. *Acta Astronautica*, Volume 153, December 2018, Pages 327-336
  37. Conte, D., Di Carlo, M., Ho, K., Spencer, D., Vasile, M.. *Earth-Mars Transfer Through Moon Distant Retrograde Orbits*. *Acta Astronautica* 2018, 143. pp. 372-379. ISSN 0094-5765.
  38. Tardioli, C., Farnocchia, D., Rozitis, B., Cotto-Figueroa, D., Chesley, S. R., Statler, T. S., Vasile, M.. *Constraints on the near-Earth asteroid obliquity distribution from the Yarkovsky effect*. *Astronomy & Astrophysics*, Vol 608, 8 December 2017.
  39. Di Carlo, M., Vasile, M., *Low-Thrust Tour of the Main Asteroid Belt*. *Advances in Space Research*, 4<sup>th</sup> Jan 2018, <https://doi.org/10.1016/j.asr.2017.12.033>.
  40. Di Carlo, M., Romero Martin, J-M, Vasile, M., *CAMELOT: Computational-Analytical Multi-fidelity Low-thrust Optimisation Toolbox*. *CEAS Journal*, 2017, <https://doi.org/10.1007/s12567-017-0172-6>.
  41. Thiry, N., Vasile, M. *Statistical Multi-Criteria Evaluation of Non-Nuclear Asteroid*

- Deflection Methods*. Acta Astronautica, Volume 140, November 2017, Pages 293-307, <https://doi.org/10.1016/j.actaastro.2017.08.021>.
42. Vetrisano, M. and Vasile, M. *Analysis of Spacecraft Disposal Solutions from LPO to the Moon with High Order Polynomial Expansions*. Advances in Space Research, 2017, doi ; 10.1016/j.asr.2017.04.005.
  43. Di Carlo M., Romero Martin, J., Vasile M. *Optimised Low-Thrust Mission to the Atira Asteroids*. Advances in Space Research, Volume 59, Issue 7, 1 April 2017, Pages 1724–1739.
  44. Thiry, N., Vasile, M. *Theoretical Peak Performance and Optical Constraints for the Deflection of an S-type Asteroid with a Continuous Wave Laser*. Advances in Space Research, Volume 59, Issue 5, 1 March 2017, Pages 1353–1367.
  45. Di Carlo, M., Romero Martin, J., Vasile, M. *Automatic Trajectory Planning for Low-Thrust Active Removal Mission in Low-Earth Orbit*. Advances in Space Research, Volume 59, Issue 5, 1 March 2017, Pages 1234–1258, 10.1016/j.asr.2016.11.033.
  46. Mehta, PM., Kubicek, M., Minisci, E., Vasile, M. *Sensitivity Analysis and Probabilistic Re-entry Modeling for Debris using High Dimensional Model Representation based Uncertainty Treatment*. Advances in Space Research, Volume 59, Issue 1, 1 January 2017, Pages 193–211.
  47. Tibert, G., Mao, H., Vasile, M., Sinn, T. *Post-Launch Analysis of the Deployment Dynamics of a Space Web Sounding Rocket Experiment*. Acta Astronautica Volume 127, October–November 2016, Pages 345–358
  48. Vetrisano M., Vasile M. *Autonomous Navigation of a Spacecraft Formation in the Proximity of an Asteroid*. Advances in Space Research, Volume 57, Issue 8, 15 April 2016, Pages 1783–1804
  49. Vasile M., Thiry N., *Nuclear Cyclers: An Incremental Approach to Asteroid Deflection*. Advances in Space Research Volume 57, Issue 8, 15 April 2016, Pages 1805–1819
  50. Vetrisano M., Vasile M., Colombo C., *Asteroid Rotation and Orbit Control via Laser Ablation*. Advances in Space Research, Volume 57, Issue 8, 15 April 2016, Pages 1762–1782.
  51. Agimelen, O., Hamilton, P., Haley, I., Nordon, A., Vasile, M., Sefcik, J., Mulholland, A., 2015, *Estimation of particle size distribution and aspect ratio of non-spherical particles from chord length distribution*, Chemical Engineering Science, vol 123, pp 629-640
  52. Vasile M., Romero Martin, J.M., Masi L., Minisci E., Epenoy R., Martinot V., Fontdecaba Baig J., *Incremental Planning of Multi-Gravity Assist Trajectories*. Acta Astronautica, Volume 115, October–November 2015, Pages 407–421.
  53. Yang, H.X., Vetrisano, M., Vasile, M., Zhang, W.H. *Autonomous navigation of spacecraft formation in the proximity of minor bodies*. Journal of Aerospace Engineering, Proceedings of the IMechE, Part G, ISSN: 0954-4100. 5YrIF-0.554, IF-0.454, HL-5.7. Doi: 10.1177/0954410015590465.
  54. Song z., Wang M., Dai G., Vasile M., (2015). *A novel multiobjective evolutionary algorithm based on regression analysis*. The Scientific World Journal vol. 2015, 2015, p. 439307.
  55. Colombo C., Letizia F., Soldini S., Lewis H., Alessi E.M., Rossi A., Vetrisano M., Van der Weg W., Vasile M., Landgraf M. *End-of-life Disposal Concepts for Libration Point and Highly Elliptical Orbit Missions*. Acta Astronautica 2014
  56. Zuiani F., Vasile M., *Extended Analytical Formulas for the Perturbed Keplerian Motion Under a Constant Control Acceleration*. Celestial Mechanics & Dynamical Astronomy, December, 2014, 10.1007/s10569-014-9600-5.
  57. Locatelli M., Vasile M. *(Non) Convergence results for the Differential Evolution method*. Optimization Letters, October 2014, 10.1007/s11590-014-0816-9.
  58. Wang M., Dai G., Vasile M. *Heuristic Scheduling Algorithm Oriented Dynamic Tasks for Imaging Satellites*. Mathematical Problems in Engineering, Volume 2014 (2014), Article ID 234928, 11 pages, <http://dx.doi.org/10.1155/2014/234928>
  59. Van der Weg W., Vasile M. *Sun-Earth L1 and L2 to Moon Transfers Exploiting Natural Dynamics*. Celestial Mechanics and Dynamical Astronomy November 2014, Volume 120, Issue 3, pp 287-308.
  60. Sinn T. Vasile M. *Inflatable Shape Changing Colonies Assembling Versatile Smart Space Structures*. Acta Astronautica Volume 104, Issue 1, November 2014, Pages 45–60.
  61. Vasile M., Gibbings A., Watson I., Hopkins J.M., *Improved Laser Ablation Model for Asteroid Deflection*. Acta Astronautica, Volume 103, October–November 2014, Pages 382–394. DOI: 10.1016/j.actaastro.2014.01.033.
  62. Van Der Weg W., Vasile M. *Contingency and Recovery Options for the European Student Moon Orbiter*. Acta Astronautica Volume 94, Issue 1, January–February

- 2014, Pages 168–183.
63. Alessi E.M., Rossi A., Valsecchi G.B., Anselmo L., Pardini C, Colombo C, Lewis H.G., Daquin J., Deleflie F., Vasile M., Zuiani F., Merz K. *Effectiveness of GNSS disposal strategies*. Acta Astronautica, Volume 99, June–July 2014, Pages 292–302.
  64. Zuiani F., Vasile M., *Multi Agent Collaborative Search Based on Tchebycheff Decomposition*, Computational Optimization and Applications September 2013, Volume 56, Issue 1, pp 189-208, DOI 10.1007/s10589-013-9552-9.
  65. Minisci E., Vasile M., *Robust Design of a Re-entry Unmanned Space Vehicle by Multi-fidelity Evolution Control*, AIAA Journal, Vol. 51, No. 6, June 2013, doi: 10.2514/1.J051573.
  66. Quarta A., Izzo D., Vasile M. *Time-Optimal Trajectories to Circumsolar Space Using Solar Electric Propulsion*. Advances in Space Research, 2012, Volume 51, Issue 3, p. 411-422.
  67. Gibbings A., Vasile M., Watson I., Hopkins J-M, Burns D., *Experimental Analysis of Laser Ablated Plumes for Asteroid Deflection and Exploitation*, Acta Astronautica, 2013, doi:10.1016/j.actaastro.2012.07.008.
  68. Gibbings A., Vasile M., Watson I., Hopkins J-M, Burns D., *Potential of laser-induced ablation for future space applications*. Space Policy, 2012, , Volume 28, Issue 3, August 2012, Pages 149–153.
  69. Zuiani F., Vasile M., Gibbings A., *Evidence-Based Robust Design of Deflection Actions for Near Earth Objects*, Celestial Mechanics and Dynamical Astronomy, July 2012, DOI 10.1007/s10569-012-9423-1.
  70. Vetrivano M., Van der Weg W., Vasile M., *Navigating to the Moon Along Low-Energy Transfers*, Celestial Mechanics and Dynamical Astronomy, 2012, October 2012, Volume 114, Issue 1-2, pp 25-53.
  71. Vasile M., Maddock C., *Design of a Formation of Solar Pumped Lasers for Asteroid Deflection*, Advances in Space Research, Volume 50, Issue 7, 1 October 2012, Pages 891–905.
  72. Zuiani F. Vasile M. *Preliminary design of Debris removal missions by means of simplified models for Low-Thrust, many-revolutions, transfers*. International Journal of Aerospace Engineering, Hindawi Publisher, 2012, Article ID 836250, 22 pages, <http://dx.doi.org/10.1155/2012/836250>.
  73. Zuiani F., Gibbings A., Vetrivano M., Rizzi F., Martinez C., Vasile M. *Orbit Determination and Control for the European Student Moon Orbiter*. Acta Astronautica, 2012, 79. pp. 67-78. ISSN 0094-5765.
  74. Zuiani F., Vasile M., Palmas A., Avanzini G. *Direct transcription of low-thrust trajectories with finite trajectory elements*. Acta Astronautica, Volume 72, March–April 2012, Pages 108–120.
  75. Schutze O.; Lara A.; Coello Coello, C. A.; Vasile M., *On the Detection of Nearly Optimal Solutions in the Context of Single-Objective Space Mission Design Problems*. Institution of Mechanical Engineers, Part G, Journal of Aerospace Engineering, September 5, 2011.
  76. Vasile M., Zuiani F. *MACS: An Agent-Based Memetic Multiobjective Optimization Algorithm Applied to Space Trajectory Design*. Institution of Mechanical Engineers, Part G, Journal of Aerospace Engineering, September 5, 2011.
  77. Minisci E., Vasile M., Hou L. *Robust Multi-fidelity Design of a Micro Re-entry USV*. Institution of Mechanical Engineers, Part G, Journal of Aerospace Engineering, September 5, 2011.
  78. Schuetze O., Vasile M., Coello-Coello C. *Computing the Set of Epsilon-Efficient Solutions in Multiobjective Space Mission Design*. AIAA Journal of Aerospace Computing, Information and Communication 8 (3). pp. 53-70, 2011.
  79. Vasile M., Minisci E., Locatelli M. *An Inflationary Differential Evolution Algorithm for Space Trajectory Optimization*. IEEE Transaction on Evolutionary Computation, April 2011.
  80. Macdonald, M., McKay, R., Vasile M., Bosquillon de Frescheville , F., Biggs, McInnes, C., *Low-Thrust Enabled Highly Non-Keplerian Orbits in Support of Future Mars Exploration*, Journal Guidance, Control, and Dynamics, In Press, 2011.
  81. Macdonald, M. and McKay, R.J. and Vasile M. and Bosquillon de Frescheville, Francois (2010) *Extension of the sun-synchronous Orbit*. Journal of Guidance, Control and Dynamics, 33 (6). pp. 1935-1940. ISSN 0731-5090..
  82. Novak D., Vasile M., *An Improved Shaping Approach to the Preliminary design of*

- Low-Thrust Trajectories*. Journal of Guidance, Control and Dynamics, 2010, 0731-5090 vol.34 no.1 (128-147).
83. Ceriotti M., Vasile M., *MGA Trajectory Planning with an ACO-inspired Algorithm*. Acta Astronautica 2010, 67 (9-10) pp.1202-1217.
  84. Ceriotti M., Vasile M., *Automated MGA Trajectory Planning with a Modified Ant Colony Algorithm*. AIAA Journal of Aerospace Computing, Information and Communication, 2010, 1542-9423 vol.7 no.9 (261-293).
  85. Vasile M., Maddock C. *On the Deflection of Asteroids with Mirrors*. Celestial Mechanics and Dynamical Astronomy, May 27, 2010, Vol. 107, Issue 1, pp 265-284.
  86. Vasile M., Minisci E., Locatelli M. *Analysis of some Global Optimization Algorithms for Space Trajectory Design*. AIAA Journal of Spacecraft and Rockets, 2010, vol. 47, no. 2, pp. 334-344.
  87. Sanchez J.P., Vasile M., Radice G. *On the Consequences of Asteroid Fragmentation during Impact Hazard Mitigation*, AIAA Journal of Guidance, Control and Dynamics, 2010, vol. 33, no. 1, pp. 126-146.
  88. Croisard N., Vasile M., Kemble S., Radice G., *Preliminary Space Mission Design Under Uncertainty*, Acta Astronautica, 2009, 10.1016/j.actaastro.2009.08.004.
  89. Colombo C., Vasile M., Radice G. *Optimal low-thrust trajectories to asteroids through an algorithm based on differential dynamic programming*, Celestial Mechanics and Dynamical Astronomy, November 2009, Volume 105, Issue 1-3, pp 75-112, DOI 10.1007/s10569-009-9224-3..
  90. Vasile M., Campagnola S. *Design of Low-Thrust Gravity Assist Trajectories to Europa*. Journal of the British Interplanetary Society, Vol. 62, No.1, pp. 15-31, 8 January 2009.
  91. Vasile M. *A memetic multi-agent collaborative search for space trajectory optimization*. International Journal of Bio-Inspired Computation, 2009, Vol. 1, No.3 pp. 186 - 197.
  92. Colombo, C., Vasile, M., and Radice, G., *Semi-analytical solution for the optimal low-thrust deflection of Near-Earth Objects*, Journal of Guidance, Control and Dynamics 32 (2009): 796-809
  93. Ceriotti M., Vasile M., Giardini G., Massari M. *An Approach to Model Interest for Planetary Rover through DSMT*. Journal of Aerospace Computing, Information, and Communication 2009 1542-9423 vol.6 no.2 (92-108),doi: 10.2514/1.37440
  94. Sanchez Cuartielles, J. P., Colombo, C., Vasile, M., and Radice, G., *Multi-criteria comparison among several mitigation strategies for dangerous near earth objects*, Journal of Guidance, Control and Dynamics 32 (2009): 121-142.
  95. Vasile M. *A Multi-Mirror Solution for the Deflection of Dangerous NEOS*. Communications in Nonlinear Science and Numerical Simulations, DOI 10.1016 (2008).
  96. Vasile M., Locatelli M., *A hybrid multiagent approach for global trajectory optimization*. Journal of Global Optimization, August 2008, DOI:10.1007/s10898-008-9329-3.
  97. Schuetze O., Vasile M., Junge O., Dellnitz M., Izzo D. *Designing Optimal Low Thrust Gravity Assist Trajectories Using Space Pruning and a Multi-Objective Approach*. Engineering Optimization, Volume 41, Issue 2 February 2009 , pages 155 - 181.
  98. Vasile M., Colombo C., *Optimal Impact Strategies for Asteroid Deflection*. Journal of Guidance, Control, and Dynamics, Vol. 31, No. 4, July–August 2008.
  99. Carnelli I., Dachwald B., Vasile M., *Evolutionary Neurocontrol: A Novel Method for Low-Thrust Gravity Assist Trajectory Optimization*. Journal of Guidance, Control, and Dynamics 2009 0731-5090 vol.32 no.2 (616-625) doi 10.2514/1.32633.
  100. Maddock C., Vasile M., *Design of Optimal Spacecraft-Asteroid Formations Through a Hybrid Global Optimization Approach*. International Journal of Intelligent Computing and Cybernetics, Vol. 1 No. 2, 2008, pp. 239-268.
  101. Vasile M., De Pascale P., Casotto S. *On the Optimality of a shape-based approach based on pseudo-equinoctial elements*. Acta Astronautica 61 (2007) 286-297.
  102. De Pascale P., Vasile M., Casotto S. *Optimal Options for Rendezvous and Impact Missions to NEOs*, Journal of the British Interplanetary Society, Vol.59, No.11, 2006.
  103. Walker, R., Izzo, D., De Negueruela, C., Summerer, L., Ayre, M., and Vasile, M., *Concepts for Near Earth Asteroid Deflection using Spacecraft with Advanced*

- Nuclear and Solar Electric Propulsion System, *Journal of the British Interplanetary Society*, Volume 58, No. 7/8, 2005, pp. 268-278.
104. De Pascale P., Vasile M., Preliminary Design of Low-Thrust Multiple Gravity Assist Trajectories. *Journal of Spacecraft and Rockets*, Vol. 43, Number 5, September-October 2006.
  105. Vasile M. De Pascale P., Preliminary Design of Multiple Gravity-Assist Trajectories, *Journal of Spacecraft and Rockets*, vol. 42, No. 4, 2006, pp. 794-805.
  106. Topputo F., Vasile M., Bernelli-Zazzera F., Low Energy Interplanetary Transfers Exploiting Invariant Manifolds of the Restricted Three Body Problem, *Journal of the Astronautical Sciences*, 2005, Vol. 53, Number 4, pp 353-372.
  107. Vasile M., Summerer L., De Pascale P., Design of Earth-Mars Transfer Trajectories using Evolutionary Branching Techniques, *Acta Astronautica* 56 (2005), pp. 705-720.
  108. Summerer L., Ongaro F., Vasile M., Galvez A., Prospects for Space Power Work in Europe, *Acta Astronautica* 53 (2003), pp. 571-575.
  109. Vasile M. Bernelli-Zazzera F., Optimizing Low-Thrust and Gravity Assist Maneuvers to Design Interplanetary Trajectories, *The Journal of the Astronautical Sciences*. Vol. 51, No. 1, January-March 2003.
  110. Vasile M., Finzi A.E, Direct Lunar Descent Optimisation by Finite Elements in Time Approach, *Journal of Mechanics and Control*, Vol. 1, No. 1, 2000.
  111. Vasile M., Bottasso C.L., Finzi A.E., Lunar Orbital Dynamics by Finite Element in Time Method, *Aerotecnica Missili e Spazio* Vol. 75. No 3/4, July-December 1996.

#### International Conference

1. Wang, Y., Vasile M. Intelligent Decision Support System for the Selecting Asteroid Deflection Strategies Under Mixed Aleatory/Epistemic Uncertainty, 3rd IAA Conference on Space Situational Awareness (ICSSA) Madrid, 4-6 April 2022.
2. Sanchez, L., Stevenson, E., Vasile M., Rodriguez-Fernandez, V., Camacho, D.. An Intelligent System for Robust Decision-Making in the All-vs-All Conjunction Screening Problem. 3rd IAA Conference on Space Situational Awareness (ICSSA) Madrid, 4-6 April 2022.
3. Vasile M., Walker, L., Dunphy, D., Zabalza, J., Murray, P., Marshall, S. and Savitski, V.. Intelligent Characterisation of Space Objects with Hyperspectral Imaging. 3rd IAA Conference on Space Situational Awareness (ICSSA) Madrid, 4-6 April 2022.
4. Fodde, I., Feng, J., & Vasile M. (2022). Robust trajectory design for ballistic landings on Dimorphos. Paper presented at American Institute of Aeronautics and Astronauts SCITECH 2022 Forum, San Diego, United States. <https://doi.org/10.2514/6.2022-1476>.
5. Walker, L. and Vasile M. (2021) Mitigation of debris in LEO using space-based lasers. In: 72nd International Astronautical Congress, 2021-10-25 - 2021-10-29.
6. Vasile M. (2021) Fast chaos expansions of diffusive and sub-diffusive processes in orbital mechanics. In: 72nd International Astronautical Congress, 2021-10-25 - 2021-10-29.
7. Wilson, Andrew Ross and Serrano, Sara Morales and Baker, Keith J. and Oqab, Haroon B. and Dietrich, George B. and Vasile, Massimiliano and Soares, Tiago and Innocenti, Luisa (2021) From life cycle assessment of space systems to environmental communication and reporting. In: 72nd International Astronautical Congress, 2021-10-25 - 2021-10-29, Dubai World Trade Centre.
8. Fodde, I., Feng, J., Riccardi, A., & Vasile M. (2021). Analysis of the robustness and mission performance of a CubeSat orbiting a binary asteroid system. Paper presented at 72nd International Astronautical Congress, Dubai, United Arab Emirates.
9. Vahid N., Manzi, M., Vasile M.. Autoencoder-based Thermospheric Density Estimation Using GPS Tracking Data. October 2021, Conference: 72nd International Astronautical Congress (IAC)At: Dubai, UAE
10. Sánchez, L. and Vasile M. (2021) Constrained optimal collision avoidance manoeuvre allocation under uncertainty for subsequent conjunction events. In: 72nd International Astronautical Congress, 2021-10-25 - 2021-10-29, Dubai World Trade Centre.
11. Marto, S., & Vasile M. (2021). Constrained multi-objective space trajectory optimisation under severe system and operational uncertainty. Paper presented at

- 72nd International Astronautical Congress, Dubai, United Arab Emirates.
12. Greco, C. Sanchez, L., Manzi, M., Vasile, M. A Robust Bayesian Agent for Optimal Collision Avoidance Manoeuvre Planning 8th European Conference on Space Debris, April, 2021.
  13. Manzi, M., Vasile, M. Autoencoder-based Thermospheric Density Model for Uncertainty Quantification and Real-Time Calibration, 8th European Conference on Space Debris, April, 2021.
  14. Acciarini, G., Vasile, M., A network-based evolutionary model of the space environment, 8th European Conference on Space Debris, April, 2021.
  15. Sanchez, L., Vasile, M. AI for Autonomous CAM Execution IAC-20-A6,2,12, In: 71st International Astronautical Congress, IAC 2020, 2020-10-12 - 2020-10-14.
  16. Manzi, M. and Vasile, M. (2020) Orbital anomaly reconstruction using deep symbolic regression. In: 71st International Astronautical Congress, IAC 2020, 2020-10-12 - 2020-10-14.
  17. Acciarini, G., & Vasile, M. (2020). A multi-layer temporal network model of the space environment. Paper presented at 71st International Astronautical Congress, IAC 2020, .
  18. Greco, C., and Vasile, M. Closing the Loop Between Mission Design and Navigation Analysis. Paper presented at 71st International Astronautical Congress, IAC 2020, .
  19. Manzi, M., Vasile, M., Analysis of Stochastic Nearly Integrable Dynamical Systems Using Polynomial Chaos Expansions, 2020 AAS/AIAA Astrodynamics Specialist Conference South Lake Tahoe, CA.
  20. Acciarini, G., Greco, C., Vasile, M., On the Solution of the Fokker-Planck Equation without Diffusion for Uncertainty Propagation in Orbital Dynamics, 2020 AAS/AIAA Astrodynamics Specialist Conference South Lake Tahoe, CA.
  21. Manzi, M. & Vasile, M., Discovering unmodeled components in astrodynamics with symbolic regression, 15 Mar 2020, IEEE World Congress on Computational Intelligence (WCCI) 2020. Piscataway, NJ: IEEE, 7 p.
  22. Sánchez, L., Vasile, M., & Minisci, E. (2020). On the use of machine learning and evidence theory to improve collision risk management. Paper presented at 2nd IAA Conference in Space Situational Awareness, Arlington, United States.
  23. Greco, C, Campagnola, S., Vasile, M, Robust Space Trajectory Design using Belief Stochastic Optimal Control, AIAA Scitech 2020 Forum, 1471.
  24. Filippi G., Vasile, M, Evidence-based resilience engineering of dynamic space systems, 70th International Astronautical Congress
  25. Graça Marto, S., Vasile, M, Epenoy, R, Multi-objective robust trajectory optimisation under epistemic uncertainty and imprecision, 70th International Astronautical Congress
  26. Sánchez, L., Vasile, M., & Minisci, E. (2019). AI to support decision making in collision risk assessment. Paper presented at 70th International Astronautical Congress, Washington D.C., United States.
  27. Greco, C., Gentile, L., Vasile, M., Bartz-Beielstein T. Robust Particle Filter for Space Objects Tracking under Severe Uncertainty, August 2019, Conference: 2019 AAS/AIAA Astrodynamics Specialist Conference At: Portland, ME
  28. Walker L., Greco C., Di Carlo M., Wilson A., Ricciardi L., Berquand A., Vasile M., Nanospacecraft exploration of asteroids by collision and flyby reconnaissance, CNES, ary Missions Conference (2019), Toulouse, France.
  29. Ricciardi L., Vasile M.. A relaxation approach for hybrid multi-objective optimal control : application to multiple debris removal mission, 29th AAS/AIAA Space Flight Mechanics Meeting, pp. 1-20 (2019)
  30. Di Carlo M., Vasile M., Greco C., Epenoy R. Robust optimisation of low-thrust interplanetary transfers using evidence theory. 29th AAS/AIAA Space Flight Mechanics Meeting 29th AAS/AIAA Space Flight Mechanics Meeting (2019)
  31. Greco C., Di Carlo M., Vasile M., Epenoy R.. An intrusive polynomial algebra multiple shooting approach to the solution of optimal control problems. 69th International Astronautical Congress (2018)
  32. Filippi G., Krpelik D., Korondi Peter Z., Vasile M., Marchi M., Poloni C. Space systems resilience engineering and global system reliability optimisation under imprecision and epistemic uncertainty, 69th International Astronautical Congress, pp. 1-13 (2018)
  33. Filippi G., Vasile M, Korondi P Z, Marchi M, Poloni C, Robust design optimisation of

- dynamical space systems. 8th International Systems & Concurrent Engineering for Space Applications Conference, pp. 1-6 (2018)
34. Greco C., Di Carlo M., Walker L., Vasile M.. Analysis of NEOs reachability with nano-satallites and low-thrust propulsion, 4S Symposium 2018 - Small Satellites Systems and Services (2018)
  35. Ricciardi L., Vasile M., MODHOC - Multi Objective Direct Hybrid Optimal Control, 7th International Conference on Astrodynamics Tools and Techniques (2018)
  36. Falchi, A., Minisci, E., Vasile, M. *A Low-Fidelity Tool for Aero-Thermal and Re-entry Analyses*. 4th International Space Debris Re-entry Workshop, February 2018
  37. Minisci, E., Vasile, M. *Meta-model Approach for the Quantification of the Reentry Distributions*. 4th International Space Debris Re-entry Workshop, February 2018.
  38. Ricciardi, LA, Maddock, CA & Vasile, M 2018, *Multi-objective optimal control of re-entry and abort scenarios* AIAA SciTech 2018, Kissimmee, United States, 8/01/18 - 12/01/18, . DOI: 10.2514/6.2018-0218.
  39. Vasile M. *Polynomial Representation of Model Uncertainty in Dynamical Systems*. Advances in Evolutionary and Deterministic Methods for Design, Optimization and Control in Engineering and Sciences. Computational Methods in Applied Sciences, vol 48. Springer, 3, July, 2018, Cham, [https://doi.org/10.1007/978-3-319-89988-6\\_25](https://doi.org/10.1007/978-3-319-89988-6_25).
  40. Minisci, E., Serra, R., Vasile, M., Riccardi, A., Grey, S., Lemmens, S., *Uncertainty Treatment in the GOCE Re-entry*, 1stIAA Conference on Space Situational Awareness (ICSSA)Orlando, FL, USAIAA-ICSSA-17-01-01.
  41. Ortega Absil, C, Filippi, G, Riccardi, A & Vasile, M 2017, *A variance-based estimation of the resilience indices in the preliminary design optimisation of engineering systems under epistemic uncertainty*. Paper presented at EUROGEN 2017, Madrid, Spain, 13/09/17 - 15/09/17, pp. 1-9.
  42. Vasile, M., Filippi, G., Riccardi, A., Ortega, C., *Fast Belief Estimation in Evidence Network Models*, EUROGEN September 2017, Madrid, Spain.
  43. Falchi, A., Minisci, E., Renato, V., Vasile, M. *FOSTRAD: An Advanced Open Source Tool for Re-entry Analysis*, October 2017, Conference: 15th Reinventing Space Conference, Glasgow, UK.
  44. Wilson, A., Vasile, M., *Integrating Life Cycle Assessment of Space Systems into the Concurrent Design Process*, IAC2017, Adelaide, Australia, 2017.
  45. Vasile, M., Rodriguez-Fernandez, V., Serra, R., Camacho, D., Riccardi, A. *Artificial Intelligence in Support to Space Traffic Management*, IAC2017, Adelaide, Australia, 2017.
  46. Greco, C., Vasile, M., *Novel Piecewise Trajectory Shaping in Hill's Canonical Variables*, IAC2017, Adelaide, Australia, 2017.
  47. Vasile, M., Torre, F., Serra, R., Grey, S. *Autonomous Orbit Determination and Navigation for Formations of Cubesats Beyond LEO*, IWSCFF 2017, Boulder, Colorado, 2017.
  48. Hoshi, K., Serra, R., Vasile, M., Yamakawa, H.. *Study of the Effects of the Lorentz Force on Space Objects with High Area-to-mass Ratio*. 31<sup>st</sup> ISTS and ISSFD, Matsuyama 2017.
  49. Torre, F., Vasile, M., Serra R., Grey, S. *Autonomous Navigation of a Formation of Spacecraft in the Proximity of a Binary Asteroid*. 31<sup>st</sup> ISTS and ISSFD, Matsuyama 2017.
  50. Di Carlo, M. Vasile, M., Kemble, S. *Optimised GTO-GEO Transfer Using Low-Thrust Propulsion*. 31<sup>st</sup> ISTS and ISSFD, Matsuyama 2017.
  51. Falchi, A., Minisci, E. Kubicek, M. Vasile, M. *Aero-Thermal Re-entry Sensitivity Analysis Using DSMC and a High Dimensional Model Representation-Based Approach*. 7<sup>th</sup> European Conference on Space Debris, 2017.
  52. Cicalò, S., Beck, J., Minisci, E., Guerra, F., Holbrough, I., Lemmens, S., Riccardi, A., Vasile, M. *Determination for Re-Entry Predictions and comparison with GPS-based POD*. 7<sup>th</sup> European Conference on Space Debris, 2017.
  53. Vasile, M., Ricciardi, L. *A Direct Memetic Approach to the Solution of Multi-Objective Optimal Control Problems*. IEEE SSCI 2016, 5-9 December 2016, Athens, Greece.
  54. Vroom, A., Di Carlo, M., Romero Martin, J-M, Vasile, M. *Optimal trajectory planning for multiple asteroid tour mission by means of an incremental bio-inspired tree search algorithm*. IEEE SSCI 2016, 5-9 December 2016, Athens, Greece.
  55. Absil, CO, Serra, R, Riccardi, A & Vasile, M 2016, *De-orbiting and re-entry analysis*



- with generalised intrusive polynomial expansions.* in 67th International Astronautical Congress. Proceedings of the International Astronautical Congress, IAC, Guadalajara, Mexico, 26-30 September.
56. Thiry, N., Vasile, M. Statistical Multicriteria Evaluation of Asteroid Deflection Methods. IAC-16,C1,4,1, IAC2016 Guadalajara, Mexico, September 26-30 2016.
  57. Ricciardi, L., Vasile, M., Toso, F., Maddock, C. *Multi-Objective Optimal Control of Ascent Trajectories for Launch Vehicles.* AIAA/AAS Astrodynamics Specialist Conference, SPACE Conferences and Exposition, (AIAA 2016-5669)
  58. Di Carlo, M., Ricciardi, L. Vasile, M., Martin, A. *Multi-Objective Optimisation of Constellation Deployment Using Low-Thrust Propulsion.* AIAA/AAS Astrodynamics Specialist Conference, SPACE Conferences and Exposition, (AIAA 2016-5577)
  59. Di Carlo, M., Vasile, M. *Low-Thrust Tour of the Main Asteroid Belt.* AIAA/AAS Astrodynamics Specialist Conference, SPACE Conferences and Exposition, (AIAA 2016-5640).
  60. Vasile, M., Minisci, E., Serra, R., Beck, J., Holbrough, I. *Analysis of the de-orbiting and re-entry of space debris with high area to mass ratio.* AIAA/AAS Astrodynamics Specialist Conference, SPACE Conferences and Exposition, (AIAA 2016-5678).
  61. Ricciardi, LA, Vasile, M & Maddock, C 2016, Global solution of multi-objective optimal control problems with multi agent collaborative search and direct finite elements transcription. in 2016 IEEE Congress on Evolutionary Computation, (CEC), 7743882, IEEE, Piscataway, pp. 869-876, 2016 IEEE Congress on Evolutionary Computation (IEEE CEC 2016), Vancouver, Canada, 24-29 July. DOI: 10.1109/CEC.2016.7743882.
  62. Thiry, N, Vasile, M & Monchieri, E 2016, Mission and system design for the manipulation of PHOs with space-borne lasers. in Aerospace Conference, 2016 IEEE., 7500610, IEEE, Piscataway, 2016 IEEE Aerospace Conference, AERO 2016, Big Sky, United States, 5-12 March. DOI: 10.1109/AERO.2016.7500610.
  63. Vetrivano, M. Cano, J.L. , Thiry, N., Tardioli, C., Vasile, M. *Optimal control of a space-borne laser system for a 100 m asteroid deflection under uncertainties.* Aerospace Conference, 2016 IEEE, 5-12 March 2016, Big Sky, MT, USA. 10.1109/AERO.2016.7500677.
  64. Vasile, M., Tardioli, C., Yamakawa, H. *Collision Avoidance as a Robust Reachability Problem Under Model Uncertainty.* 26th AAS/AIAA Space Flight Mechanics Meeting, Napa, California, U.S.A., 14–18 February 2016.
  65. Romero Martin, J-M, Di Carlo, M., Vasile M., *Automatic Planning and Scheduling of Active Removal of Non-Cooperative Satellites in Low Earth Orbit.* 66<sup>th</sup> International Astronautical Congress, Jerusalem, IAC-15-C1.2.9, October 2015.
  66. Vasile, M. and Di Carlo, M. *Efficient Solution of Min-Max Problems with a Combination of Surrogate Models and Inflationary Differential Evolution,* EUROGEN2015, Glasgow, UK.
  67. Vasile M., *Polynomial Representation of Model Uncertainty in Dynamical Systems,* EUROGEN2015, Glasgow, UK.
  68. Peng, L., Vasile M., Dai, G. and Hu, H. *Differential Evolution with Local Search and Re-Initialization.* EUROGEN2015, Glasgow, UK.
  69. Ricciardi, L.A. and Vasile, M. *Improved archiving and search strategies for Multi Agent Collaborative Search.* EUROGEN2015, Glasgow, UK.
  70. Vetrivano M, Thiry N, Vasile M. *Detumbling large space debris via laser ablation.* In IEEE Aerospace Conference Proceedings. 2015. Available from, DOI: 10.1109/AERO.2015.7119051.
  71. Ricciardi, A., Tardioli, C., Vasile, M., *An Intrusive Approach to Uncertainty Propagation in Orbital Mechanics Based on Tchebycheff Polynomial Algebra.* Astrodynamics Specialists Conference, AAS 15-544, Veil, Colorado, USA, 9-13 August 2015.
  72. Tardioli, C., Vasile, M., *Collision and Re-entry Analysis Under Aleatory and Epistemic Uncertainty,* Astrodynamics Specialists Conference, AAS 15-709, Veil, Colorado, USA, 9-13 August 2015.
  73. Tardioli, C., Kubicek, M., Vasile, M., Minisci, E., Ricciardi, A., *Comparison of Non-Intrusive Approaches to Uncertainty Propagation in Orbital Mechanics.* Astrodynamics Specialists Conference, AAS 15-545, Veil, Colorado, USA, 9-13 August 2015.
  74. Thiry, N., Vasile, M. *Deflection of uncooperative targets using laser ablation.* Proc. SPIE 9616, Nanophotonics and Macrophotonics for Space Environments IX,

- 96160X (September 1, 2015); doi:10.1117/12.2197261
75. Marilena Di Carlo, M., Ortiz Gomez, N., Romero Martin, J.M., Tardioli, C., Gachet, F., Kumar, K., Vasile, M., Optimized Low-Thrust Mission to the Atira Asteroids, AAS 15-299, AAS, Space Flight Mechanics Meeting, 2015
  76. Di Carlo, M.; Vasile, M.; Minisci, E. *Multi-population adaptive inflationary differential evolution algorithm with adaptive local restart*. 2015 IEEE Congress on Evolutionary Computation, CEC 2015, Sendai, Japan.
  77. Thiry N., Vasile M., *Recent Advances in Laser Ablation Modelling for Asteroid Deflection Methods*. Proc. SPIE 9226, Nanophotonics and Macrophotonics for Space Environments VIII, 922608 (September 17, 2014); doi:10.1117/12.2060810
  78. Vasile M. On the Solution of Min-Max Problems in Robust Optimization, EVOLVE2014, Beijing, China.
  79. Di Carlo M., Vasile M., Minisci E. *Multi-Population Inflationary Differential Evolution*. BIOMA2014, Bioinspired Optimization Methods and their Applications 13 September 2014, Ljubljana, Slovenia.
  80. Romero Martin J.M., Masi L., Vasile M., Minisci E., Epenoy R., Martinot V., Fontescaba Baig J. *Incremental Planning of Multi-Gravity Assist Trajectories*. IAC-14-C1.9.2 65th International Astronautical Congress, Toronto, Canada.2014.
  81. Vasile M., Alicino S. *An Approach for the Robust Design of the Power Systems of Small Satellites*. IAC-14.C3.4.2, 65th International Astronautical Congress, Toronto, Canada.2014.
  82. Alicino S. Vasile M. *Analysis of Two Algorithms for Multi-Objective MIN-MAX Optimization. Bio-inspired Optimization Methods and their Applications*, BIOMA 14. Ljubljana, Slovenia, 13/09/14
  83. Alicino S. Vasile M. Evidence-based Preliminary Design of Spacecraft, 6th International Conference on Systems & Concurrent Engineering for Space Applications. SECESA 2014, 08-10 October 2014, Vaihingen Campus, University of Stuttgart, Germany.
  84. Duering, Marcel and Landgraf, Markus and Vasile, Massimiliano (2014) Station-keeping for quasi-periodic orbits. In: 65th International Astronautical Congress, 2014-09-29 - 2014-10-03, Metro Toronto Convention Centre.
  85. Alicino S. Vasile M. An Evolutionary Approach to the Solution of Multi-objective Min-Max Problems in Evidence-Based Robust Optimization. Congress on Evolutionary Computation CEC2014, 9th July 2014, Beijing, China.
  86. Minisci E., Vasile M., Adaptive Inflationary Differential Evolution. Congress on Evolutionary Computation CEC2014, 9th July 2014, Beijing, China.
  87. Masi L., Vasile M., A Multidirectional Physarum Solver for the Automated Design of Space Trajectories. Congress on Evolutionary Computation CEC2014, 9th July 2014, Beijing, China.
  88. Colombo C., Letizia F., Soldini S., Lewis H., Alessi E.M., Rossi A., Vetrivano M., Van der Weg W., Vasile M., Landgraf M. End-of-life Disposal Concepts for Libration Point and Highly Elliptical Orbit Missions. IAA-AAS-DyCoSS2-14-03-01. 2nd IAA Conference on Dynamics and Control of Space Systems (DYCOSS), March 24-26, 2014, Roma, Italy
  89. Alessi E. M., Rossi A., Valsecchi G., Anselmo G., Pardini C., Colombo C., Lewis H., Deleflie F., Daquin J, Vasile M., Merz K., *Effectiveness of GNSS disposal strategies*. IAC-13.A6.2.4. 64<sup>th</sup> International Astronautical Congress, 23-27 September 2013, Beijing, China.
  90. Sinn T., Hilbich D., Vasile M. *Inflatable shape changing colonies assembling versatile smart space structures*. IAC-13.C2.5.2. 64<sup>th</sup> International Astronautical Congress, 23-27 September 2013, Beijing, China.
  91. Duering M., Vasile M., Landgraf M.. *Manoeuvring considerations for quasi-periodic trajectories*. IAC-13.C1.8.4, 64<sup>th</sup> International Astronautical Congress, 23-27 September 2013, Beijing, China.
  92. M. Duering, M. Vasile, M. Landgraf, Optimal manoeuvring between quasi-periodic orbits, 5th International Conference on Spacecraft Formation Flying Missions and Technologies, Munich, Germany, 2013
  93. Alicino S., Vasile M., *Preliminary Design of Space Systems Subject to Mixed Aleatory-Epistemic Uncertainty*. IAC-13.D1.P.16, 64<sup>th</sup> International Astronautical Congress, 23-27 September 2013, Beijing, China.
  94. Van der Weg W., Vasile M., Landgraf M. *Earth-Sun L1 and L2 to Moon transfers exploiting natural dynamics*. IAC-13.C1.8, 64<sup>th</sup> International Astronautical

- Congress, 23-27 September 2013, Beijing, China.
95. Alicino S., Vasile M., *A Multi Objective Algorithm for Maximization of Belief Function*. EVOLVE2013, Leiden 10-13 July 2013.
  96. Masi L., Vasile M. *Physarum KISS: an Innovative Algorithm for the Preliminary Analysis of Multi-Gravity Assist Interplanetary Trajectories*. EVOLVE2013, Leiden 10-13 July 2013.
  97. Vasile M., Zuiani F. *Improved Individualistic Actions for Multi-Agent Collaborative Search*. EVOLVE2013, Leiden 10-13 July 2013.
  98. Alicino S., Vasile M. *Surrogate-based Maximisation of Belief Function for Robust Design Optimisation*. 54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, April 8-11, 2013, DOI: 10.2514/6.2013-1757.
  99. Gibbings A., Vasile M., Hopkins J-M, Burns D., Watson I., *Experimental Characterization of the Thrust Induced by Laser Ablation on an Asteroid*. IAA-PDC2013-04-21, Planetary Defense Conference 2013, Flagstaff, USA.
  100. Vasile M., Vetrivano M., Gibbings A., Garcia Yarnoz D., Sanchez Cuartielles J-P, Hopkins J-M, Burns D., McInnes C., Colombo C., Branco J., Wayman A., Eckersley S., *Light-Touch2: A Laser-Based Solution for the Deflection, Manipulation and Exploitation of Small Asteroids*, IAA-PDC13-04-22, Planetary Defense Conference 2013, Flagstaff, USA.
  101. Zuiani F., Kawakatsu Y. and Vasile M. *Multi-Objective Optimisation of Many-Revolution, Low-Thrust Orbit Raising for Destiny Mission*. AAS 13-264, 23rd AAS/AIAA Space Flight Mechanics Conference, 2013.
  102. Mankins, J., Kaya, N. and Vasile, M. *SPS-ALPHA: The First Practical Solar Power Satellite via Arbitrarily Large Phased Array (A 2011-2012 NIAC Project)* 10th International Energy Conversion Engineering Conference, 30 July 2012 - 01 August 2012, Atlanta, Georgia, <https://doi.org/10.2514/6.2012-3978>
  103. Vasile M., *Fractionated Solar Power Satellite for Regional Coverage*, IAC-12-C3.1.5. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  104. Sinn, T. , McRobb, M. , Wujek, A. , Skogby, J. , Rogberg, F. , Wang, J. , Vasile, M. & Tibert, G. *Results of REXUS12's Suineadh Experiment : Deployment of a spinning space web in micro gravity conditions*. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  105. Komninou E., Vasile M., Minisci E., *Optimal Dynamic Operations Scheduling for Small-Scale Satellites*. IAC-12,B4.3.7. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  106. Van der Weg W., Vasile M., *High Area-to-Mass Ratio Hybrid Propulsion Earth to Moon Transfers in the CR3BP*. IAC-12-C1.4.8. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  107. Sinn T., Vasile M. *Bio-inspired Programmable Matter for Space Applications*. IAC-12-C2.5.1. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  108. Gibbings, Alison and Vasile, Massimiliano (2012) *Smart Cloud : A novel method for the deflection and mitigation of asteroids*. In: *Astrobiology Science Conference 2012*, 2012-04-16 - 2012-04-20.
  109. Vetrivano M., Vasile M. *Collaborative Guidance Navigation and Control of Disaggregated Spacecraft in the Proximity of Minor Bodies*. IAC-12.C1.3.11. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  110. Zuiani F., Vasile M., *Extension of Finite Perturbative Elements for Multi-Revolution Low-Thrust Transfer Optimisation*. IAC-12-C1.4.6. 63rd International Astronautical Congress, Naples, Italy, September 2012.
  111. Vetrivano M., Yang H., Vasile M., Zhang W. *Autonomous Navigation of Spacecraft Formations for Asteroid Exploration*. 23<sup>rd</sup> International Symposium on Space Flight Dynamics, Pasadena Convention Centre, Pasadena, USA, October 29- November 2, 2012.
  112. Duering Marcel, Vasile M., Landgraf M. *Uncontrolled spacecraft formations on two-dimensional invariant tori*. 23<sup>rd</sup> International Symposium on Space Flight Dynamics, Pasadena Convention Centre, Pasadena, USA, October 29- November 2, 2012.
  113. Zuiani F., Vasile M., *Multi-Agent Collaborative Search with Tchebycheff Decomposition and Monotonic Basin Hopping Steps*. BIOMA, 5th International Conference on Bio-Inspired Optimisation Methods and their Application, Slovenja, May 2012.

114. Masi L., Vasile M., *A Multidirectional Modified Physarum Solver for Optimal Discrete Decision Making*. BIOMA, 5th International Conference on Bio-Inspired Optimisation Methods and their Application, Slovenja, May 2012.
115. Vasile M., Minisci E., Wijnand Q. *Approximated Computation of Belief Functions for Robust Design Optimization*. AIAA-2012-1932 14th AIAA Non-Deterministic Approaches Conference. 23–26 April 2012 Sheraton Waikiki, Honolulu, Hawaii.
116. Sinn T., Vasile M., *Design and Development of a Deployable Self-inflating Adaptive Membrane*. AIAA-2012-1517 20th AIAA/ASME/AHS Adaptive Structures Conference, 23–26 April 2012 Sheraton Waikiki, Honolulu, Hawaii.
117. Vasile M., Minisci E., Zuiani F., Komninou E., Wijnands Q. *Fast Evidence-Based Space System Engineering*. IAC-11,D1, 62stInternational Astronautical Congress: Cape Town, South Africa, October 2011.
118. Van der Weg W., Vasile M., *Contingency and Recovery Options for the European Student Moon Orbiter* IAC-11,B4, 62stInternational Astronautical Congress: Cape Town, South Africa, October 2011.
119. Vetrivano M., Vasile M., *Navigation and Contingency Analysis of the European Student Moon Orbiter* IAC-11,A3, 62stInternational Astronautical Congress: Cape Town, South Africa, October 2011.
120. Sinn T., Vasile M., *Deployment Simulation of Very Large Inflatable Tensegrity Reflectors* IAC-11,C2, 62stInternational Astronautical Congress: Cape Town, South Africa, October 2011.
121. Komninou E., Vasile M., Minisci E., *Optimal Power Harness Routing for Small-Scale Satellites* IAC-11,C3, 62stInternational Astronautical Congress: Cape Town, South Africa, October 2011.
122. Gibbings A., Komninou E., Vasile M., *Investigation and Modelling of Large Scale Cratering Events - Lessons Learnt from Experimental Analysis* IAC-11,E1, 62stInternational Astronautical Congress: Cape Town, South Africa, October 2011.
123. Minisci E., Campobasso S., Shek J.K.H., Vasile M., *Multi-disciplinary Robust Design of Variable Speed Wind Turbines*. EUROGEN 2011, Capua, Naples, September 2011.
124. Vasile M., Minisci E., *An Evolutionary Approach to Evidence-based Multidisciplinary Robust Design Optimisation*, EUROGEN 2011, Capua, Naples, September 2011.
125. Minisci E., Vasile M., *Robust Design of a Re-entry Unmanned Space Vehicle by Multi-fidelity Evolution Control*. GECCO 2011, Dublin, Ireland, July 2011.
126. Gibbings A., Hopkins J-M, Burns D. Vasile M. *On Testing Laser Ablation Processes for Asteroid Deflection*, 2011 IAA Planetary Defense Conference 09-12 May 2011, Bucharest, Romania.
127. Gibbings A, Vasile M., *Impact Cratering Experiments onto Highly Porous Bodies*. 2011 IAA Planetary Defense Conference 09-12 May 2011, Bucharest, Romania.
128. Vasile M., Maddock C. *Orbital Debris Removal with Solar Concentrators*. IAC-10-A6.4. 61stInternational Astronautical Congress: Prague, Czech Republic, October 2010.
129. Novak D., Vasile M. *Incremental Solution of LMTGA Transfers Transcribed with and Advanced Shaping Approach*. Paper IAC-10-C1.9.8. 61stInternational Astronautical Congress: Prague, Czech Republic, October 2010.
130. Zuiani F., Vasile M., Palmas A., Avanzini G. *Direct Transcription of Low-Thrust Trajectories with Finite Trajectory Elements*. Paper IAC-10,C1,7,5. 61stInternational Astronautical Congress: Prague, Czech Republic, October 2010.
131. Vasile M., Summerer L. *Multiobjective Optimization of and Integrated Space-Based and Terrestrial Solar Energy System*. Paper IAC-10-C3.1.5, 61stInternational Astronautical Congress: Prague, Czech Republic, October 2010.
132. Gibbings A., Vasile M., *Kinematic Impactors – Improved Modelling of Asteroid Deflection*, European Planetary Science Congress 2010, September 2010, Rome.
133. Vasile M. *Finite elements in Time: A Direct Transcription Method for Optimal Control Problems*. AAS, Astrodynamics Specialist Conference, Toronto 1-5 August 2010.
134. Minisci E., Hou L., Vasile M., *Multidisciplinary Design of a micro-USV for Re-entry Operations*. AAS, Astrodynamics Specialist Conference, Toronto 1-5 August 2010.
135. Gibbings A, Novak D., Martinez C., Rizzi F., Zuiani F., Vasile M., *Navigation Analysis and Manoeuvres Design for ESMO*. Small Satellite Systems and Services Symposium 2010, Madeira, Portugal.
136. Cariotti M., Vasile M. *Automatic MGA trajectory planning with Ant Colony*

- Optimization*. 21<sup>st</sup> International Symposium on Space Flight Dynamics, September 28 to October 2, 2009 - Toulouse, France.
137. Novak D., Vasile M.. *A new shaping approach for preliminary low-thrust trajectory design*. 21<sup>st</sup> International Symposium on Space Flight Dynamics, September 28 to October 2, 2009 - Toulouse, France.
138. Ceriotti M., Vasile M. *MGA trajectory planning with an ACO-inspired algorithm* 60<sup>th</sup> International Astronautical Congress IAC-09.C1.1.3, October 12-16 2009, Daejeon, Republic of Korea.
139. Novak D., Vasile M. *An improved approach to preliminary mission design using fast linear quadratic intermediate optimizations* 60<sup>th</sup> International Astronautical Congress IAC-09.C1.10.5, October 12-16 2009, Daejeon, Republic of Korea.
140. Gary S., Radice G., Wijnands Q., Vasile M. *Image Selection Algorithm for GMES mission*. 60<sup>th</sup> International Astronautical Congress IAC-09.B1.4.6, October 12-16 2009, Daejeon, Republic of Korea.
141. Summerer L, Purcell O., Vasile M., Tibert G., Kaya N. *Making the first steps towards solar power from space – microgravity experiments testing the deployment of large antennas*. 60<sup>th</sup> International Astronautical Congress IAC-09.C3.4.4, October 12-16 2009, Daejeon, Republic of Korea.
142. Gray S., Radice G. Wijnands Q. Vasile M. *Design of a Multi-Agent System for Cost Reduction in Multi-Craft Space*. 60<sup>th</sup> International Astronautical Congress IAC-09.D1.4.5, October 12-16 2009, Daejeon, Republic of Korea.
143. Biggs J., McDonald M., McInnes C., Vasile M. *Non-Keplerian orbits using low thrust, high Isp propulsion systems*. 60<sup>th</sup> International Astronautical Congress IAC-09.C1.2.8, October 12-16 2009, Daejeon, Republic of Korea.
144. Maddock C, Vasile M., McInnes C., Radice G., Summerer L. *Design of multi-spacecraft swarms for deflection of Apophis by solar sublimation*. 1st IAA Planetary Defense Conference, Granada, Spain, April 27-30, 2009.
145. Croisard N., Vasile M., Kemble S., Radice G., Preliminary Space Mission Design Under Uncertainty. IAC-08-D1.3, Glasgow 2008.
146. Sanchez J.P., Vasile M., Radice G. On the Consequences of a Fragmentation Due to a NEO Mitigation Strategy. IAC-08- C1.3.10, Glasgow 2008.
147. Vasile M., Minisci E., Locatelli M. Testing Approaches for Global Optimization of Space Trajectories, BIOMA 2008.
148. Vasile M., A Multi-Mirror Solution for the Deflection of Dangerous NEOs. 2<sup>nd</sup> Conference on Nonlinear Science and Complexity, 28-31 July, 2008, Porto, Portugal.
149. Vasile M., Minisci E., Locatelli M., On Testing Global Optimization Algorithms for Space Trajectory Design. AIAA/AAS Astrodynamics Specialist Conference, 18-21 August 2008, Honolulu Hawaii.
150. Vasile M., Maddock C., Radice G., Mirror Formation Control in the Vicinity of an Asteroid. AIAA/AAS Astrodynamics Specialist Conference, 18-21 August 2008, Honolulu Hawaii.
151. Novack D., Colombo C., Heiligers J., Vasile M., On the Design of Low-Thrust Transfers Through L1 for the ESMO Mission. 6th International Congress on Industrial and Applied Mathematics, 16-20 July 2007, Zurich, Switzerland.
152. Ceriotti M., Vasile M., Bombardelli C., An Incremental Algorithm for Fast Optimisation of Multiple Gravity Assist Trajectories. International Astronautical Congress, paper IAC-07-C1.3.04, Hyderabad, 24-28 September 2007.
153. Colombo C., Vasile M., Optimal Trajectories for NEO Deflection, International Astronautical Congress, paper IAC-07-C1.4.02, Hyderabad, 24-28 September 2007.
154. Vasile M., Ceriotti M., De Pascale P., An Incremental Approach to the Solution of Global Trajectory Optimization Problems. AGO 2007, Advances in Global Optimization 2007, Mykonos, Greece.
155. Vasile M., Croisard N., Reliable Trajectory Design Through Evidence Theory and Multiobjective Optimization. AGO 2007, Advances in Global Optimization 2007, Mykonos, Greece.
156. Ceriotti, M., Croisard, N., Vasile, M., Non-Deterministic Planner for Planetary Rovers (extended abstract), Workshop on Artificial Intelligence for Space Applications (IJCAI-07), Hyderabad, India, January 2007.
157. Croisard, N., Ceriotti, M., Vasile, M., Uncertainty Modelling in Reliable Preliminary Space Mission Design (extended abstract), Workshop on Artificial Intelligence for

- Space Applications (IJCAI-07), Hyderabad, India, January 2007.
158. Vasile M., Locatelli M., A Behavioural-Based Approach to the Global Optimisation of Space Mission Design Problems, EURO XXI, Reykjavik, Iceland, July 2006.
  159. Ceriotti, M., Vasile, M., Giardini, G., Massari, M., A Non-Deterministic Planner for Planetary Rover Autonomy. AIAA/AAS Astrodynamics Specialist Conference and Exhibit, Guidance, Navigation, and Control and Co-located Conferences, AIAA 2006-6679, Keystone, Colorado, 2006. <http://dx.doi.org/10.2514/6.2006-6679>.
  160. Massari M., Giardini G., Vasile M., Autonomous Control of a Rover for Planetary Exploration based on Behavioral Algorithms. 7th International Conference on Dynamics and Control of Systems and Structures in Space 2006.
  161. Massari M., Giardini G., Cazzadori P., Vasile M., Reflexive Control of a Rover for Planetary Exploration with Artificial Neural Networks. 7th International Conference on Dynamics and Control of Systems and Structures in Space 2006.
  162. Carnelli I., Dachwald B., Vasile M., Evolutionary Neurocontrol as a Novel Method for Low-Thrust Gravity Assist Trajectory Optimization. ISTS 2006-d-46.
  163. Vasile M., Depascale P., Casotto S., On the Optimality of a Shaped-Based Approach Based on Pseudo-Equinoctial Elements. IAC-06-C1.4.5. 56th International Astronautical Congress, 2-5 October 2006, Valencia, Spain.
  164. Sanchez Cuartielles J. P., Colombo C., Vasile M., Radice G., A Multi-criteria Assessment of Deflection Methods for Dangerous NEOs, New Trends in Astrodynamics and Applications III, Princeton, August 16-18, 2006.
  165. Colombo C., Sanchez Cuartielles J. P., Vasile M., Radice G., A Comparative Assessment of Different Deviation Strategies for Dangerous NEOs, IAC-06-A3.P.05, 56th International Astronautical Congress, 2-5 October 2006, Valencia, Spain.
  166. Aguzzi M., Villanti M., Radice G., Cartmell M., Vasile M. A Logistic System Based on Momentum Exchange Tethers for Earth-Moon Cargo Transportation, IAC-06-D3.2.06
  167. Vasile M., Robust Mission Design Through Evidence Theory and Multi-Agent Collaborative Search. New Trends and Applications II, June 3-5, 2005, Princeton, NJ, USA.
  168. Di Lizia P., Radice G., Vasile M., Izzo, D., On the Solution of Interplanetary Trajectory Design Problems by Global Optimisation Methods. Global Optimization Workshop, September 18-22, Almeria, Spain.
  169. Vasile M., A Hybrid Multi-Agent Collaborative Search Applied to the Solution of Space Mission Design Problems. Global Optimization Workshop, September 18-22, Almeria, Spain.
  170. De Pascale P., Vasile M., Casotto S., Transfer Options for Missions to Near Earth Objects. IAC 2005, September 16-21, 2005, Fukuoka, Japan.
  171. Bonetti D., Vasile M. A New Multidisciplinary Approach to RLV Design. IAC 05.D.2.4.01, IAC 2005, September 16-21, 2005, Fukuoka, Japan.
  172. Colombo C., Ceriotti M., Scarrì E, Vasile M. Trajectory Optimization for the Hevelius Lunar Microsatellite Mission. IAC 05.C.1.5.05, IAC 2005, September 16-21, 2005, Fukuoka, Japan.
  173. Scarrì E, Ceriotti M., Colombo C., Vasile M., Mission Analysis of Hevelius-Lunar Microsatellite Mission, IAC 2005, September 16-21, 2005, Fukuoka, Japan.
  174. Vasile M., Robustness Optimisation of Aerocapture Trajectories Design Using a Hybrid Co-evolutionary Approach. 18th International Symposium on Spaceflight Dynamics. 11-15 October 2004, Munich, Germany
  175. Summerer L., Pipoli T., Galvez A, Ongaro F., Roles of Solar Power from Space for Europe: Space Exploration and Combination with Terrestrial Solar Planets. IAC-04-R.1.03. 55th International Astronautical Congress Vancouver, Canada, October 4-8 2004
  176. Topputo F. Vasile M., Bernelli-Zazzera F., Interplanetary and Lunar Transfers Using Libration Points Approach. 18th International Symposium on Spaceflight Dynamics. 11-15 October 2004, Munich, Germany
  177. De Pascale P., Vasile M. Casotto S., Preliminary Analysis of Low-Thrust Gravity Assist Trajectories by An Inverse Method and a Global Optimization Technique. 18th International Symposium on Spaceflight Dynamics. 11-15 October 2004, Munich, Germany
  178. Vasile M., Bonetti D., Evolution of the Concurrent Design Process Under Uncertainties. International Concurrent Engineering Workshop, ESA/ESTEC 30

- Sptember-1 October 2004
179. Walker R., Izzo D., De Negueruela C., Summerer L., Ayre M, Vasile M., Concepts for Near-Earth Asteroid Deflection Using Spacecraft with Advanced Nuclear and Solar Electric Propulsion Systems. IAC-04-Q.5.08 55th International Astronautical Congress Vancouver, Canada, October 4-8 2004
  180. De Pascale P., Vasile M., Casotto S., A Tool for The Preliminary Trajectory Design of Interplanetary Missions Exploiting Gravity Assists and Low-Thrust Propulsion. 55th International Astronautical Congress Vancouver, Canada, October 4-8 2004
  181. Topputo F., Vasile M, Bernelli Zazzera F., A Hybrid Optimization of the Low Energy Interplanetary Transfers associated to the Invariant Manifolds of the Restricted Three-Body Problem. 55th International Astronautical Congress Vancouver, Canada, October 4-8 2004
  182. Topputo F., Vasile M., Finzi A.E., Combining Two and Three-Body Dynamics for Low Energy Transfer Trajectories of Practical Interest. 55th International Astronautical Congress Vancouver, Canada, October 4-8 2004
  183. Saive G., Vasile M. Probabilistic Optimisation Applied to Spacecraft Rendezvous on Keplerian Orbit. 6th International Conference on Dynamics and Control of Systems and Structures in Space 2004
  184. Linder N., Vasile M., Comparison Between Cyclers and Stop-Over Cyclers for a Regular Earth-Mars Transportation System. 6th International Conference on Dynamics and Control of Systems and Structures in Space 2004
  185. Topputo F., Vasile M., Finzi A., An Approach to the Design of Low Energy Interplanetary Transfers Exploiting Invariant Manifolds of the Restricted Three-Body Problem, Paper AAS 04-245, 14th AAS/AIAA Space Flight Mechanics Conference, 8-12 February 2004, Maui, Hawaii
  186. De Pascale P., Vasile M., Finzi A., A Tool for Preliminary Design of Low Thrust Gravity-Assist Trajectories. Paper AAS 04-250, 14th AAS/AIAA Space Flight Mechanics Conference, 8-12 February 2004, Maui, Hawaii
  187. Pessina S., Campagnola S., Vasile M., Preliminary Analysis of Interplanetary Trajectory with Aerogravity and Gravity Assist Manoeuvres. IAC-03-A.P.08, 54th International Astronautical Congress, 29 September-3 October 2003, Bremen, Germany
  188. Summerer L., Ongaro F., Vasile M., Galvez A., Space and Ground Based Large Scale Solar Power Plants-A European Perspective. IAC-03-R.1.09. 54th International Astronautical Congress, 29 September-3 October 2003, Bremen, Germany
  189. Vasile M., Galvez A., Summerer L., Ongaro F., Design of Low-Thrust Trajectories for the Exploration of the Outer Solar System. IAC-03-A.P.14. 54th International Astronautical Congress, 29 September-3 October 2003, Bremen, Germany
  190. Vasile M, Summerer, L., De Pascale, P., Design of Earth-Mars Transfer Trajectories using Evolutionary Branching Techniques, IAC-03-A.7.07, 54th International Astronautical Congress, 29 September-3 October 2003, Bremen, Germany
  191. Massari M., Bernelli-Zazzera F., Vasile M., Trajectory Optimization for a Mission to NEOs using Low-Thrust Propulsion and Gravity Assist. AAS 03-120, 13th AAS/AIAA Space Flight Mechanics Meeting, Ponce, Puerto Rico, 9-13 February 2003
  192. Vasile M., A Global Approach To Optimal Space Trajectory Design. AAS-03-141, 13th AAS/AIAA Space Flight Mechanics Meeting, 9-13 February 2003, Puerto Rico
  193. Vasile M., Biesbroek R., Summerer L., Gálvez A., Kminek G., Options for a Mission to Pluto and Beyond. 13th AAS/AIAA Space Flight Mechanics Meeting, Ponce, Puerto Rico, 9-13 February 2003
  194. Vasile M., A Systematic-Heuristic Approach for Space Trajectory Design. New Trends in Astrodynamics and Application, - An international Conference, Washington 20-22 January 2003
  195. Vasile M., A Global Optimization Algorithm for Space Trajectory Design. ICORD 2002 Conference. Anna University. INDIA December 2002
  196. Vasile M., Robust Optimization of Trajectory Intercepting Dangerous NEO. AAS/AIAA Astrodynamics Specialist Conference, 5-8 August 2002, Monterey, California, U.S.A
  197. Vasile M. Sironi F., Bernelli-Zazzera F., Deep Space Autonomous Orbit Determination Using CCD. AAS/AIAA Astrodynamics Specialist Conference, 5-8

- 2002 August, Monterey California, U.S.A
198. Vasile M., Campagnola S., Bernelli-Zazzera F., Electric Propulsion Options for a Probe to Europa. 2nd International Symposium on Low Thrust Trajectories (LOTUS2), Toulouse 18-20 June 2002
  199. Vasile M., Bernelli-Zazzera F., Direct Averaging for Multiple Revolution Trajectory Optimisation. 2nd International Symposium on Low Thrust Trajectories (LOTUS2), Toulouse 18-20 June 2002
  200. Vasile M., Bernelli-Zazzera F., Direct Multiphase Optimisation of Multiobjective Trajectory Design Problems. AAS/AIAA Space Flight Mechanics Conference. 27-30 January 2002, San Antonio Texas, U.S.A
  201. Vasile M., Davighi A., Staffiere G., Lavagna M., Autonomous Landing Manoeuvre by Landmark Tracking Technique. AAS/AIAA Space Flight Mechanics Conference. 27-30 January 2002, San Antonio Texas, U.S.A
  202. Vasile M., Bernelli-Zazzera F., Targeting a Heliocentric Orbit Combining Low-Thrust Propulsion and Gravity Assist Manoeuvres. 16th Space Flight Dynamics Symposium. 3-7 December 2001, Pasadena California, U.S.A
  203. Vasile M., Bernelli-Zazzera F., Orbit Determination by Optical Devices. ESA Workshop on On-Board Autonomy, ESA WPP-191, Ottobre 2001, pp. 371-378
  204. Vasile M., Bernelli-Zazzera F., Combining Low-Thrust and Gravity Assist Manoeuvres to Reach Planet Mercury. AAS/AIAA Astrodynamics Specialist Conference, 30 Jul-2 Aug 2000, Quebec City, Canada
  205. Bernelli-Zazzera F., Ferrario I., Massari M., Vasile M., Autonomous Navigation with Stereo Vision System for Interplanetary Exploration. 52nd International Astronautical Congress, Toulouse France, October 1-5, 2001
  206. Vasile M., Bernelli-Zazzera F., Jehn R., Janin G., Optimal Interplanetary Trajectories Using a Combination of Low-Thrust and Gravity Assist Manoeuvres. IAF-00-A.5.07, 51st International Astronautical Congress, 2-6 Oct, 2000/Rio de Janeiro, Brazil
  207. Vasile M., Romano M. An Optical Based Strategy for Deep Space Autonomous Navigation. 4th ESA International Conference on Spacecraft Guidance, Navigation and Control Systems, 18-21 October 1999, ESTEC, Noordwijk, The Netherlands
  208. Goossens S., Floberghagen R., Vasile M., Long-Term Orbit Predictions for Low-Lunar Satellites Under the Influence of Gravity and Solar Radiation Pressure. IAF-99-A.4.01 50th International Astronautical Congress 4-8 Oct 1999 Amsterdam, The Netherlands
  209. Bernelli-Zazzera F., Finzi A.E., Romano M., Vasile M., Preliminary Design of the Microsatellite PalaMede. International Astronautical Federation Specialists Symposium on Novel Concepts for Smaller, Faster & Better Space Missions, Redondo Beach, California, April 1999
  210. Finzi A. E., Vasile M., Optimal Attitude Trajectory Manoeuvre for Moon Landing. Proc. of the 49th IAF congress, Melbourne, Australia, 2-8 October 1998
  211. Vasile M., Floberghagen R., Optimal Trajectories for Lunar Landing Missions. NASA/CP-1998-206858, Proc. of 13th International Symposium on Space Flight Dynamics, Washington D.C., Vol.1, pp. 243-257, AAS 98-321, 11-15 May 1998
  212. Floberghagen R., Visser P., Weischede F., Vasile M., On the Analysis of Lunar Albedo Effects on Low Lunar Orbit and Gravity Field Determination. Proc. of 13th International Symposium on Space Flight Dynamics, Washington D.C., Vol.1, pp.11-15, May 1998
  213. Finzi A.E., Vasile M., Numerical Solution for Lunar Orbits. IAF-97-A.5.08, Proc. of the 48th International Astronautical Congress, Torino, Italy, October 6-10, 1997
  214. Romano M. Vasile M. *Analysis of Two Methods for the Trajectory Optimisation of Robotic Arms.* XV Congresso Nazionale A.I.D.A.A. Torino 15-19 Novembre 1999
  215. Vasile M., Galgani F., Finzi A.E. *Economical Earth-Moon transfers: A Qualitative Study.* V Congresso Nazionale della SIMAI, Ischia Porto 05-09 Giugno 2000
  216. Vasile M., Comoretto G., Finzi A.E. *A Combination of Evolution Programming and SQP for WSB Transfer Optimisation.* AIRO2000, September 18-21 2000 Milano, Italy.
  217. Vasile M., Davighi A., Staffiere G., Finzi A.E. *A Vision System for Autonomous Landing Manoeuvres* XVI Congresso Nazionale AIDAA, Palermo 24-28 Novembre 2001.
  218. Vasile M., Finzi A.E. *Combining Evolutionary Programs and Gradient Methods for WSB Transfer Optimisation.* XVI Congresso Nazionale AIDAA, Palermo 24-28 Novembre 2001.



219. Vasile M. *Space Trajectory Optimisation in a Concurrent Design Environment: Results and Related Issues*. Convegno Nazionale dell'AIRO, 10-13 Settembre 2002 L'Aquila, Italia

#### Internal Reports

220. Vasile M., Maddock C., McInnes C., Radice G. NEO deflection through a multi-mirror system. Final Ariadna Report, Ariadna ID: 08/4301, May 2009.
221. Vasile M., Ceriotti M., Radice G., Becerra V., Nasuto S., Anderson J. Global Trajectory Optimisation: Can We Prune the Solution Space when Considering Deep Space Manoeuvres?. Ariadna Final Report (06-4101), 2008.
222. Vasile M., Schutze, O., Junge, O., Radice, G., and Dellnitz, M., Spiral Trajectories in Global Optimisation of Interplanetary and Orbital Transfers, European Space Agency, the Advanced Concepts Team, Ariadna Final Report (05-4106), 2006.
223. McKenzie D., Cartmell M., Radice G., Vasile M., Space Webs, Ariadna Study final report 05/4109, 2006.
224. Zazzera, F.B., Vasile, M., Massari, M., and Di Lizia, P., Assessing the Accuracy of Interval Arithmetic Estimates in Space Flight Mechanics, European Space Agency, the Advanced Concepts Team, Ariadna Final Report (04-4105), 2005.
225. Vasile M. *Direct Transcription by FET for Optimal Space Trajectory Design*. Internal Report DIA-SR 99-02, 1999
226. Vasile M. Jehn R. *Low Thrust Orbital Transfer for a LISA Spacecraft With Constraints on the Solar Aspect Angle*. ESA/ESOC MAS WP 424, 1999
227. Mouzer Z, Jeh R., Kha M., Ladgraf M., Pello J.L., Yanez A., Vasile M., *Mercury Cornerstone Mission Analysis: Orbit Evolution, Communication and Lander Options*. MAS WP 425, March 2000 ESA/ESOC
228. Vasile M. *Workshop on Trajectory Design and Optimisation: Final Report*. ESA WPP-210, ESA/ESTEC 24-25 October 2002

#### PRESENTATIONS AND SEMINARS

- Dates (from-to) October 2009
- Name and type of contract/award Key note lecture at ISICA 2009, Wuhan, China
  
- Dates (from-to) September 2009
- Name and type of contract/award Invited talk at CelMech V, 2009, Viterbo Italy
  
- Dates (from-to) September 2009
- Name and type of contract/award Invited lecture at the 2009 summer school organized by Astronet, Institute of Industrial Mathematics, Paderborn, Germany
  
- Dates (from-to) October 2010
- Name and type of contract/award Public lecture on asteroid deflection at the Stirling Astronomical Society, Stirling, UK.
  
- Dates (from-to) March 2011
- Name and type of contract/award Invited public talk on asteroid deflection at the Edinburgh science festival, Edinburgh, UK
  
- Dates (from-to) June 2011
- Name and type of contract/award Invited talk at New Trends in Astrodynamics and Applications 20011, New York, USA
  
- Dates (from-to) March 2011
- Name and type of contract/award Key note speaker at EVOLVE 2011, Luxemburg.
  
- Dates (from-to) September 2011

- Name and type of contract/award Key note speaker at EUROGEN 2011, Capua, Italy.
- Dates (from-to) February 2011
- Name and type of contract/award Invited talk Cambridge Astronomical Society, Cambridge, UK.
- Dates (from-to) March 2011
- Name and type of contract/award Invited talk INRIA, Bordeaux, Bordeaux, France.
- Dates (from-to) December 2012
- Name and type of contract/award Invited talk CNES Workshop on Evolutionary Computation
- Dates (from-to) February 2013
- Name and type of contract/award Invited talk Optimisation and Uncertainty Quantification Workshop, Universita' di Trieste, Trieste, Italy.
- Dates (from-to) September 2017
- Name and type of contract/award Invited lectures at the CelMecVII summer school in Viterbo, Italy
- Dates (from-to) March 2018
- Name and type of contract/award Invited talk at the ModeFrontier user meeting Trieste, Italy
- Dates (from-to) September 2019
- Name and type of contract/award Key note at EUROGEN2019 Guimaraes, Portugal

**FUNDED PROJECTS**

- Dates (from-to) January 2000-October 2001
- Name and type of contract/award Design of Interplanetary and Lunar Missions Combining Low Thrust with Gravity Assists. AO/1-3557/99/D/CS  
200000 euros
- Work description PI. Development of a software tool for the design and optimization of low-thrust gravity assist trajectories.  
Specific applications to the BepiColombo mission, to the SOLO mission and to the SMART-1 mission.
- Funding Source European Space Agency
- Dates (from-to) January 2005-December 2005
- Name and type of contract/award Multisensor Autonomous Rover, ESA/ITI contract  
50000 euros
- Work description PI. Development of an advanced system for rover autonomy.  
The system, called WISDOM, is based on a three layer architecture, composed of: a sapiens (or deliberative) layer able to perform non-deterministic planning and goal reallocation; a behavioral layer based on a fuzzy-logic action-reaction transformation; a reflexive layer based on neural networks.  
The study led to a successful prototyping of the autonomous system on a 6 wheeled rover designed and built within the study.
- Funding Source European Space Agency
- Dates (from-to) January 2005-May 2005
- Name and type of contract/award Ariadna study: Assessing the Accuracy of Interval Arithmetic Estimates in Space Flight Mechanics

- Work description 25000 euros  
PI. Assessment of the suitability of interval based integrators for orbital dynamics and applications.
  - Funding Source European Space Agency
  
- Dates (from-to) January 2006-May 2006
  - Name and type of contract/award Ariadna study: SPIRAL TRAJECTORIES IN GLOBAL OPTIMISATION OF INTERPLANETARY AND ORBITAL TRANSFERS. Contract code 05-4106, 2006  
25000 euros
  - Work description PI. Development of a branch&prune algorithm for the fast preliminary solution of low-thrust gravity assist trajectories.
  - Funding Source European Space Agency
  
- Dates (from-to) January 2006-May 2006
  - Name and type of contract/award Ariadna study: Spacewebs. final report 05/4109, 2006.  
25000 euros
  - Work description Co-I. Analysis of the deployment and dynamics of a space web
  - Funding Source European Space Agency
  
- Dates (from-to) January 2006-March 2006
  - Name and type of contract/award Lunavetor  
10000 euros
  - Work description Co-I. ESA sponsored study on innovative transportation systems for future Moon missions
  - Funding Source European Space Agency through Thales/Alenia Space
  
- Dates (from-to) January 2007-2009
  - Name and type of contract/award Advanced Transportation Systems for Moon and Mars  
10000 euros
  - Work description Co-I. ESA sponsored study on innovative transportation systems for future Moon missions
  - Funding Source European Space Agency through Thales/Alenia Space
  
- Dates (from-to) January 2007-2009
  - Name and type of contract/award ICASE: Tools and Methods for Preliminary Low-thrust trajectory Design  
85000 pounds
  - Work description PI. Development of methods and algorithms for an efficient generation of first guess solutions for low-thrust gravity assist trajectories and for a fast analysis of complex LT-MGA trajectories.
  - Funding Source EPSRC-QinetiQ
  
- Dates (from-to) August 2006
  - Name and type of contract/award Consultancy contract for the design of trajectories for the Don Quijote mission.  
3000 pounds
  - Work description PI. Design of and analysis of several trajectories targeting different asteroids.
  - Funding Source QinetiQ
  
- Dates (from-to) January 2007-September 2007
  - Name and type of contract/award Ariadna: study: Global Trajectory Optimisation: Can we Prune the Solution Space when Considering Deep Space Manoeuvres?. Contract code 06-4101, 2008  
35000 euros
  - Work description PI. Development of a method and algorithm for the fast design of complex multigravity assist trajectories with multiple deep space maneuvers and low-thrust arcs.  
The algorithm should provide an automated trajectory and mission planning and scheduling
  - Funding Source European Space Agency
  
- Dates (from-to) July 2006-December 2006

- Name and type of contract/award Subcontractor of GMV for the development of a component of the Astrotoolbox  
15000 euros
  - Work description PI. Development of a software tool for preliminary trajectory design in Matlab.
  - Funding Source European Space Agency-through GMV
  
- Dates (from-to) December 2007-current
- Name and type of contract/award DAFA  
Total value of the contract is 300000 euros
  - Work description Co-I. Study contract on Distributed Agents for Space Autonomy.
  - Funding Source European Space Agency-through GMV
  
- Dates (from-to) May 2008-December 2008
- Name and type of contract/award Ariadna study: NEO deflection through a multi-mirror system  
26000 Euros
  - Work description PI. Study contract on an Innovative Deflection method for Asteroids.
  - Funding Source European Space Agency
  
- Dates (from-to) June 2009-March 2010
- Name and type of contract/award Extension to the Space Web Study  
25000 Euros
  - Work description PI. Development of spacecraft to be launched with the REXUS launcher in March 2010 to test the deployment of a space web by controlled centrifugal force.
  - Funding Source European Space Agency
  
- Dates (from-to) June 2009-February 2010
- Name and type of contract/award Subcontractor of the University of Strathclyde for the ESA study: Gravity Gradient compensation with Low-Thrust propulsion.  
18000 Euros
  - Work description PI. Mission analysis for the low-thrust transfers to the Artificial Equilibrium points and analysis of the contingency options..
  - Funding Source European Space Agency through University of Strathclyde
  
- Dates (from-to) October 2009-December 2012 (expected)
- Name and type of contract/award European Space Earth Orbiter (ESEO)  
80000 Euros
  - Work description PI. Development of the harness and user ground segment for the ESEO satellite..
  - Funding Source European Space Agency through Gavazzi Space
  
- Dates (from-to) December 2009-December 2014 (expected)
- Name and type of contract/award European Space Moon Orbiter (ESMO)  
110000 Euros
  - Work description PI. Prime team for Mission Analysis, Trajectory Design and Flight Dynamics for the ESMO satellite.
  - Funding Source European Space Agency through Surrey Satellite Limited
  
- Dates (from-to) March 2010-June 2011 (expected)
- Name and type of contract/award ITI ESA Study on Robust Design Optimisation of Space Missions  
50000 Euros
  - Work description PI. Proof of concept implementation of techniques, based on Evidence Theory, for the robust design optimization of space systems.
  - Funding Source European Space Agency ITI programme
  
- Dates (from-to) October 2010-June 2011 (expected)
- Name and type of contract/award Planetary Society: Study on Plume Contamination During Asteroid Deflection Actions with High Power Lasers  
30000 USD
  - Work description PI. Experimental Testing of contamination levels on reflective surfaces during laser

- Funding Source ablation of asteroid representative samples  
Planetary Society
- Dates (from-to) November 2011-December 2014
  - Name and type of contract/award ESA Network Partner Initiative. Robust Design Optimisation of space systems  
45000 euros
  - Work description PI. Computational optimisation development of innovative techniques based on Evidence Theory for the robust design of space systems and the modeling of uncertainties in the design process. Particularly focused on the preliminary design phase with applications to concurrent and collaborative engineering.
  - Funding Source European Space Agency
- Dates (from-to) June 2011-December 2014
  - Name and type of contract/award ESA Network Partner Initiative. Formation design and control at libration points  
110000 Euros
  - Work description PI. Astrodynamics and control design and control of formations and swarms at libration points with application to next generation observatories.
  - Funding Source European Space Agency
- Dates (from-to) June 2011-December 2014
  - Name and type of contract/award NSTP. Innovative Hybrid Propulsion Systems for Cubesats  
34582 Pounds
  - Work description PI. New hybrid low-thrust impulsive systems for long distance transfers of cubesats beyond GEO
  - Funding Source UK Space Agency
- Dates (from-to) Feb 2013-Feb2017
  - Name and type of contract/award Stardust - FP7 Marie Curie Action  
4.06 Million Euros ITN
  - Work description PI. of Stardust the asteroid and space debris network
  - Funding Source European Commission
- Dates (from-to) October 2012- December 2012
  - Name and type of contract/award ESA SYSNova challenge  
100000 Euros
  - Work description PI. of the LightTouch<sup>2</sup> mission concept for small asteroid deflection
  - Funding Source European Space Agency
- Dates (from-to) December 2012- November 2013
  - Name and type of contract/award Planetary Society  
35000 USD
  - Work description Experimental analysis of the laser bees concept for asteroid deflection
  - Funding Source Planetary Society
- Dates (from-to) September 2012- March 2013
  - Name and type of contract/award Cluster Fund  
5600 pounds
  - Work description Organisation of UQO13 a sandpit on Uncertainty Quantification and Optimisation
  - Funding Source Faculty
- Dates (from-to) November 2012- March 2013
  - Name and type of contract/award Small Equipment Grant  
10000 pounds
  - Work description Acquisition of a laser
  - Funding Source EPSRC

- Dates (from-to) March 2012- February 2013
  - Name and type of contract/award KE Development Fund  
10000 pounds
  - Work description Development of the CPD in Fundamentals of Space Mission Analysis and Design
  - Funding Source Faculty
  
- Dates (from-to) February 2013- October 2013
  - Name and type of contract/award ESA ITT on Debris Removal from MEO  
150000 Euros
  - Work description PI. of the Work-package on active debris removal technologies
  - Funding Source European Space Agency
  
- Dates (from-to) February 2013- October 2013
  - Name and type of contract/award ESA ITT on Debris Removal from LPO and HEO  
200000 Euros
  - Work description PI. of the Work-package on active debris removal from LPO
  - Funding Source European Space Agency
  
- Dates (from-to) December 2012- November 2013
  - Name and type of contract/award Global Trajectory Optimisation  
63000 Euros
  - Work description PI. of the study on the development of advanced techniques for the global optimisation of space trajectories
  - Funding Source CNES-Thales France
  
- Dates (from-to) December 2012- March 2013
  - Name and type of contract/award WISCER project  
10000 Pounds
  - Work description PI. of the study on the development inflatable antennas
  - Funding Source DSTL
  
- Dates (from-to) December 2014- March 2017
  - Name and type of contract/award NPI – Multiobjective Hybrid Optimal Control  
45000 Euros
  - Work description PI. of the study to develop methods and software to solve multiobjective optimal control problems
  - Funding Source ESA
  
- Dates (from-to) November 2015- November 2016
  - Name and type of contract/award ExproPlus – Uncertainty quantification during re-entry  
150000 Euros
  - Work description Co-I. uncertainty quantification for the re-entry of GOCE
  - Funding Source ESA
  
- Dates (from-to) June 2016- May 2017
  - Name and type of contract/award ITI – Robust Space Mission Design  
150000 Euros
  - Work description Co-I. inventor of the method based on belief functions
  - Funding Source ESA
  
- Dates (from-to) January 2017- December 2020
  - Name and type of contract/award UTOPIAE (Uncertainty Treatment and OPTimisation in Aerospace Engineering) – h2020 Marie Curie Action  
4.0 MEuros ETN

- Work description PI. Advanced optimization and uncertainty quantification techniques for the treatment of high dimensional complex aerospace systems
- Funding Source European Commission
  
- Dates (from-to) November 2017- December 2020
- Name and type of contract/award SIROM  
3.5 MEuros Project
- Work description Co-I. advanced interface for space robotics autonomous systems
- Funding Source European Commission
  
- Dates (from-to) November 2017- December 2020
- Name and type of contract/award INFUSE  
3.5 MEuros Project
- Work description Co-I. advanced data fusion system for space autonomy
- Funding Source European Commission
  
- Dates (from-to) May 2016- December 2017
- Name and type of contract/award DEUQ  
50000 Euros
- Work description PI. Advanced techniques for the quantification of uncertainty in the re-entry of high area-to-mass ratio objects
- Funding Source UKSA
  
- Dates (from-to) June 2017- December 2017
- Name and type of contract/award CUSPT  
10000 Euros
- Work description PI. Innovative debris tracking and detection system based on passive bi-static radar
- Funding Source UKSA
  
- Dates (from-to) October 2015- October 2016
- Name and type of contract/award NEOcities  
£29,000
- Work description PI. Workshop on Optimisation for Future Cities
- Funding Source British Council
  
- Dates (from-to) December 2017- November 2018
- Name and type of contract/award Robust Mission Design  
63000 Euros
- Work description PI. of the study on methods for stochastic optimal control for robust mission design.
- Funding Source CNES France
  
- Dates (from-to) January 2019- December 2022
- Name and type of contract/award Stardust-R (Stardust-Reloaded) – h2020 Marie Curie Action  
3.9 MEuros ETN
- Work description PI. Space Traffic Management, asteroid exploration
- Funding Source European Commission
  
- Dates (from-to) December 2018- November 2019
- Name and type of contract/award Robust Mission Design  
63000 Euros
- Work description PI. of the study on methods for stochastic optimal control for robust mission design.
- Funding Source CNES France

- Dates (from-to) December 2019- December 2022
  - Name and type of contract/award OSIP – Multi-layer Temporal Network Model of the Space Environment  
90000 Euros
  - Work description PI. Development of a new model of the space environment
  - Funding Source ESA
  
- Dates (from-to) December 2019- December 2022
  - Name and type of contract/award OSIP – 3 Dimensional Phased Array Antenna for Active and Passive Debris Detection and Tracking  
90000 Euros
  - Work description PI. Development of a passive system for space debris tracking and identification
  - Funding Source ESA
  
- Dates (from-to) December 2019- December 2022
  - Name and type of contract/award OSIP – Teaching new dogs old tricks?: Using chatbot technology to assure quality knowledge capture from space experts for rapid transfer through systematic learning.  
90000 Euros
  - Work description PI. Development of an artificial intelligence agent for systems engineering
  - Funding Source ESA
  
- Dates (from-to) December 2020- December 2023
  - Name and type of contract/award OSIP – AI for Space Traffic Management  
90000 Euros
  - Work description PI. Development of an artificial intelligence agent called CASSANDRA for space traffic management
  - Funding Source ESA
  
- Dates (from-to) May 2020- Feb 2021
  - Name and type of contract/award CENSUS – new in orbit space debris detection and tracking system.  
£75000
  - Work description PI. Development of an in orbit passive radar system for space debris detection and tracking
  - Funding Source UKSA
  
- Dates (from-to) May 2020- Dec 2020
  - Name and type of contract/award Assessment of a very high power cargo transportation system to Mars.  
£27k
  - Work description Co-I. Mission and system design optimization for a human mission to Mars
  - Funding Source ESA
  
- Dates (from-to) Sept 2020- August 2023
  - Name and type of contract/award Using Chatbot Technology To Assure Quality Knowledge Capture From Spaces.  
90k Euros
  - Work description PI. Development of an interactive chatbot for knowledge capture and retrieval in space systems engineering
  - Funding Source ESA
  
- Dates (from-to) December 2020- March 2022
  - Name and type of contract/award CAELUS– drone delivery system in Scotland.  
£1.5M
  - Work description Co-I. Design and optimization of the network of drones for the transport of medical items
  - Funding Source Innovate UK
  - Dates (from-to) July 2021- July 2024
  - Name and type of contract/award OSIP – CORES: Collaborative Recycling of Solar Power Satellites



- Work description 90000 Euros
  - Funding Source PI:Development of innovative solutions for the recycling of large infrastructures in space ESA
  
- Dates (from-to) November 2021- March 2022
  - Name and type of contract/award HyperSST: Hperspectral Imaging for Space Surveillance and Tracking. £212.2k
  - Work description PI:Development of hyperspectral imaging for space objects characterization
  - Funding Source UKSA
  - Dates (from-to) November 2021- March 2022
  - Name and type of contract/award AI4SST: Artificial Intelligence for Space Surveillance and Tracking £192K
  - Work description PI:Development of the CASSANDRA framework for space environment management
  - Funding Source UKSA
  - Dates (from-to) November 2021- March 2022
  - Name and type of contract/award FASTFRAG- Breaking-up is never easy £220K
  - Work description Co-I:Development of multi-fidelity re-entry analysis of space objects
  - Funding Source UKSA
  
- Dates (from-to) December 2021- December 2022
  - Name and type of contract/award IRIS £ 150k
  - Work description Co-I. Development of intercontinental radar system for space surveillance and tracking
  - Funding Source DASA
  
- Dates (from-to) July 2022- June 2024
  - Name and type of contract/award CAELUS2 £ 10M
  - Work description Co-I. Design and optimization of the network of drones for the transport of medical items
  - Funding Source Innovate UK
  
- Dates (from-to) May 2022- May 2023
  - Name and type of contract/award HyperClass £ 150k
  - Work description PI. Hyperspectral imaging for space object classification
  - Funding Source ESA
  - Dates (from-to) September 2022- March 2024
  - Name and type of contract/award SAAP £ 250k
  - Work description PI. Long term attitude dynamics of space objects
  - Funding Source ESA
  - Dates (from-to) September 2022- March 2024
  - Name and type of contract/award DYNAMIC ORBITAL RISK AND SAFETY ASSESSMENTS IN A CHANGING SPACE DEBRIS ENVIRONMENT - £ 95k
  - Work description PI. Long term evolution of the risk of collision in Orbit
  - Funding Source ESA
  - Dates (from-to) November 2022- October 2024
  - Name and type of contract/award Generative Mapping and Control of Stationary Points in Complex Dynamical Systems - £ 250k
  - Work description PI. New approach to dynamical systems under uncertainty
  - Funding Source EPSRC
  
- Dates (from-to) Nov 2022- Nov 2025
  - Name and type of ESCAPE - Exploration of the Space CArrying capacity ProblEm- 90k Euros

- contract/award
  - Work description PI. Analysis of the capacity of the space environment to include new objects
  - Funding Source ESA
  - Dates (from-to) June 2022- May 2024
  - Name and type of contract/award Intercontinental Radar bistatic System (IRIS) - OSIP Idea- 90k Euros
  - Work description Co-I. Manoeuvre detection using intercontinental bistatic radars
  - Funding Source ESA
  - Dates (from-to) May 2022- March 2023
  - Name and type of contract/award The interaction of structural dynamics with the orbital mechanics of Solar Power Satellites- £36k
  - Work description Co-I. Analysis of the coupling between structural mechanics, attitude and orbit of a large infrastructure such as a solar power satellite
  - Funding Source ESA
  - Dates (from-to) May 2022- October 2023
  - Name and type of contract/award AI-Powered Digital Assistant for Space System Engineering- £86.2k
  - Work description Co-I. Development of a digital assistant to support systems engineering and spacecraft design
  - Funding Source ESA
  - Dates (from-to) July 2021- June 2026
  - Name and type of contract/award ESA ENVIRONMENTAL LCA DATABASE- 100k Euros
  - Work description PI. Update of the ESA LCA database
  - Funding Source ESA
  - Dates (from-to) October 2022- October 2025
  - Name and type of contract/award Data-driven aErothermal and thermomeChanical mOdelling for Destructive re-Entry- 90k Euros
  - Work description Co-I. Data-driven methods for re-entry analysis of space objects
  - Funding Source ESA
  - Dates (from-to) May 2011-October 2012
  - Name and type of contract/award CPD in Space Mission Analysis and Design
  - Work description About 19000 pounds per installment, 3 installments
  - Funding Source Creation, organization and delivery of the Continuous Professional Development course.  
Vitrociset
  - Name and type of contract/award
  - Work description
  - Funding Source
- Conferences**
- Dates (from-to) September 2015
  - Name and type of contract/award Conference: EUROGEN2015
  - Work description About 90 attendees
  - Funding Source General chair.  
Conference fees
  - Dates (from-to) September 2018
  - Name and type of contract/award Conference; SECESA2018
  - Work description About 140 attendees
  - Funding Source General chair.  
Conference fees

- Dates (from-to) July 2019
- Name and type of contract/award Conference; IWSCFF2019  
About 75 attendees
- Work description General chair.
- Funding Source Conference fees

**AWARDS AND RECOGNITIONS**

- Dates (from-to) October 2007
- Name and type of contract/award Hans von Muldau Team Award
- Work description Best group project award for the design of the ESA mission ESMO.
- Awarding Body International Astronautical Federation
  
- Dates (from-to) 2007
- Name and type of contract/award Listed by the New York Times as one of the most interesting ideas of 2007
- Work description Research on asteroid deflection: Asteroid deflection by solar ablation with multiple mirrors.
- Awarding Body New York Times
  
- Dates (from-to) October 2007
- Name and type of contract/award Best student paper award
- Work description Best British student paper to the international Astronautical Congress for the design of the ESA mission ESMO.
- Awarding Body British Interplanetary Society
  
- Dates (from-to) 2008
- Name and type of contract/award Highly commended paper
- Work description .Design of optimal formation orbits in the proximity of asteroids using evolutionary algorithms
- Awarding Body International Journal of Intelligent Computing and Cybernetics
  
- Dates (from-to) 2009
- Name and type of contract/award Highly commended Award Winner
- Work description .Design of optimal formation orbits in the proximity of asteroids using evolutionary algorithms
- Awarding Body Emerald Literati Network 2009 awards for Excellence
  
- Dates (from-to) May 2009
- Name and type of contract/award Outstanding Paper Award
- Work description . Chairman's Recognition of Outstanding Paper for the paper titled "A dynamical System Prospective on Evolutionary Heuristics Applied to Space Trajectory Optimization Problems" at the 2009 IEEE Congress on Evolutionary Computation
- Awarding Body IEEE CEC 2009
  
- Dates (from-to) October 2010
- Name and type of contract/award Hans von Muldau Team Award
- Work description Best group project award for the design of the ESA mission ESMO.
- Awarding Body International Astronautical Federation

- Dates (from-to) October 2012
- Name and type of contract/award Hans von Muldau Team Award
- Work description Best group project award for the design of the Rexus Experiment SAM.
- Awarding Body International Astronautical Federation
  
- Dates (from-to) July 2015
- Name and type of contract/award Sir Arthur Clarke award for achievements in space research
- Work description Stardust, the ITN I am leading, is awarded for best space research project in 2015. I am the runner up for the individual prize as leader of the project
- Awarding Body British Interplanetary Society
  
- Dates (from-to) October 2015
- Name and type of contract/award ESA Moon Challenge
- Work description The students I am supervising win the international competition ESA Moon Challenge for the design of a manned mission to the Moon.
- Awarding Body European Space Agency
  
- Dates (from-to) September 2016
- Name and type of contract/award Asteroid 2002 PX33 is named Maxvasile
- Work description The asteroid is named after me in recognition to the work done in Stardust on planetary defence.
- Awarding Body IAU
  
- Dates (from-to) August 2020
- Name and type of contract/award AAS/AIAA Best paper award
- Work description Paper: Cristian Greco, Stefano Campagnola, and Massimiliano Vasile Robust Space Trajectory Design using Belief Stochastic Optimal Control
- Awarding Body AAS/AIAA
  
- Dates (from-to) October 2021
- Name and type of contract/award Best interactive paper award, 72nd International Astronautical Congress
- Work description Paper: Sanchez L., Vasile. M. Constrained optimal collision avoidance manoeuvre allocation under uncertainty for subsequent conjunction events.
- Awarding Body IAF
  
- Dates (from-to) September 2022
- Name and type of contract/award Best PhD Paper Award in "Innovation in Smart Cities and Systems" at the 32nd European Safety and Reliability Conference (ESREL 2022)
- Work description Paper "Multi-layer Resilience Optimisation for Next Generation Drone Logistic Networks"
- Awarding Body ESREL

**PROFESSIONAL ASSOCIATIONS**

Senior Member IEEE  
Associate Fellow AIAA  
Member AAS  
Member of the Space Power Committee of the International Astronautical Federation  
Member of the AIAA Astrodynamics Committee  
Member of the AAS Space Flight Mechanics Committee  
Chairman of the IEEE CIS Task Force on Computational Intelligence in Aerospace Sciences

**EDITORIAL WORK**

Associate Editor of the AIAA Journal of Guidance Control and Dynamics  
Editorial Board of Communications in Nonlinear Science and Numerical Simulations  
Associate Editor of Frontiers in Space Technologies  
Associate Editor of Celestial Mechanics and Dynamical Astronomy  
Associate Editor of MDPI Aerospace  
Associate Editor of Nature Scientific Reports

**REFEREES**

Franco Ongaro  
Director of ESA DTEC  
ESA/HQ , 8-10 rue Mario Nikis, 75738 Paris Cedex 15, France  
[Franco.ongaro@esa.int](mailto:Franco.ongaro@esa.int)  
Ph. +33-(0)1-53697651

Dr Leopold Summerer  
Advanced Concepts Team  
ESA/ESTEC, Keplerlaan 1, AZ Noordwijk, The Netherlands  
[Leopold.summerer@esa.int](mailto:Leopold.summerer@esa.int)  
Ph. +31-(0)71-565-6227

PROF HIROSHI YAMAKAWA  
RESEARCH INSTITUTE FOR SUSTAINABLE HUMANOSPHERE  
KYOTO UNIVERSITY  
TEL: +81-774-38-3805  
FAX: +81-774-31-8463  
E-MAIL: YAMAKAWA@RISH.KYOTO-U.AC.JP