Gautier Picot

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Academic Positions

Instructor (September 2012-July 2017)
Department of Mathematics, University of Hawai'i at Manoa.

Postdoctoral Researcher (September 2011-August 2012)
Department of Mechanical Engineering, University of Hawai'i at Manoa.

Teaching and Research Assistant (January 2011–August 2011)
Institute of Mathematics, University of Burgundy, France.

Education

Ph.D. in Mathematics (defended on November 29th, 2010)
Title : Geometric and numerical methods in optimal control and applications to the Earth-Moon transfer problem
supported by CNRS and Conseil Régional de Bourgogne
Institute of Mathematics, University of Burgundy, France
Advisor : Bernard Bonnard.

M.S in Mathematics (2007)
Speciality Applied Mathematics and Modeling
University of Orleans, France.

B.S in Pure Mathematics (2005)
University of Orleans, France.

Publications

Journal articles

1. M. Chyba, G. Patterson and G. Picot, *Time-minimum control of the restricted elliptic three-body problem applied to space transfer*, In Special Issue "Recent Advances in Celestial and Space Mechanics", Springer International Publishing, 179-208 (2016).

2. M. Chyba, J.-M Coron, P. Gabriel, A. Jacquemard, G. Patterson, G. Picot and P. Shang, *Optimal Geometric Control Applied to the Protein Misfolding Cyclic Amplication Process*, Acta Appl. Math., **135** (2015), 145-173.

3. M. Chyba, M. Granvick, R. Jedicke, G. Patterson G. Picot and J. Vaubaillon, *Designing Rendezvous Missions with Mini-Moons using Geometric Optimal Control*, J. Ind. Manag. Optim. **10** (2014), no 2, 477-501.

4. G. Picot, *Shooting and numerical continuation method for computing time-minimal and energy-minimal trajectories in the Earth-Moon system using low-propulsion*, Discrete Cont. Dyn. Syst. Ser. B, **17** (2012), 245–269.

5. B. Bonnard, J.B. Caillau and G. Picot, *Geometric and numerical techniques in optimal control of the two and three body problems*, Commun. Inf. Syst., **4** (2010), 239–278.

Contribution chapter

1. B. Bolin, M. Chyba, M. Granvick, R. Jedicke, G. Patterson and G. Picot, *Earth's Temporarily-Captured Natural Satellites-The First Step on the Ladder to Asteroid Resources*, Asteroids. Prospective Energy and Material Resources, Springer-Verlag, Berlin, New York, (2013).

Proceedings

1. M. Chyba, M. Granvick, R. Jedicke, G. Patterson G. Picot and J. Vaubaillon, *Time-minimal transfers to TCO*, Optimization and Control Techniques and Applications, Springer Proceedings in Mathematics and Statistics, **86** (2014), 213-235.

2. G. Picot, *Energy-minimal transfers in the vicinity of the Lagrangian point L_1*, AIMS proceedings, Proceedings of the 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, 2010, Discrete Cont. Dyn. Syst. Suppl. (2011), 1196–1205.

3. G. Picot, O.Adam, M. Bergounioux, H.Glotin and F-X. Mayer, *Automatic prosodic clustering of humpback whales songs*, Digital Object Identifier : 10.1109/PASSIVE.2008.4786974, (2008).

Talks

Asteroid Rendezvous Missions, An Application of Optimal Control, Accelerated Graduate Course on Geometric Optimal Control with Applications, Institute of Mathematics for Industry, Fukuoka, June 2015.

Méthodes indirectes en contrôle optimal pour le calcul de trajectoires spatial, séminaire de l'ENSEEIHT, Toulouse, April 2013.

Two-Dimensional Time-Minimum Space Transfers to Temporary Captured Near Earth Orbiters, the 5th International Conference on Optimization and Control with Applications, Beijing, December 2012.

Singular Trajectories in the Contrast Problem in Nuclear Magnetic Resonance, the 5th International Conference on Optimization and Control with Applications, Beijing, December 2012.

Time-optimal transfers to rendezvous with temporarily captured objects in the Earth-Moon system, Workshop on Applied Mathematics and Related Topics, University of Hawai'i at Manoa, October 2012.

Geometric and Numerical methods in optimal control and applications to space mechanics, seminar of control theory, Department of Mathematics, University of Hawai'i at Manoa, December 2011.

Geometric and Numerical methods in optimal control and applications to the Earth-Moon transfer, Conference SMAI, Lorient, May 2011.

Numerical and geometric techniques in optimal control and computations of low-thrust transfers in the Earth-Moon systems, Institute for Design and Control of Mechatronical Systems, Linz, April 2011.

Energy-minimal Earth-Moon trajectories in the Earth-Moon system, seminar of the young researchers of the Institute of Mathematics of Burgundy, Dijon, November 2010.

Control in the vicinity of the point L2, seminar about the Lagrange points, CNES, Toulouse, June 2010.

Optimal Earth-Moon transfers using low-propulsion, The 8th AIMS Conference on dynamical systems, Differential Equations and Applications, Dresden, May 2010.

Normal forms in the vicinity of the Lagrangian point L1, seminar of quantum control of the Institute of Mathematics of Burgundy, Dijon, March 2010.

Energy-minimal and time-minimal simulations of Earth-Moon transfers, seminar of the young researchers of the Institute of Mathematics of Burgundy, Dijon, December 2009.

Optimal control of orbital transfers in the restricted 3-body problem, Conference of the Ph.D students from the Universities of Dijon and Besancon, Dijon, May 2009.

Automatic clustering of humpback whales songs, seminar of the young researchers of the Institute of Mathematics of Burgundy, Dijon, December 2008.

Automatic clustering of humpback whales songs, Passive '08, Hyères, October 2008.

Krauss operators in finite dimension and dissipative evolution, seminar of quantum control of the Institute of Mathematics of Burgundy, Dijon, January 2008.

Automatic clustering of humpback whales songs, seminar of the MAPMO, Orléans, October 2007.

Teaching

Spring 2016

- Precalculus: Trigonometry, Analytic Geometry (Math 140), Linear Algebra and Differential Equations (Math 307), Numerical Analysis (Math 407), University of Hawai'i at Manoa, USA.

Fall 2015

- Calculus II (Math 242), Calculus III (Math 243), Introduction to Differential Equations I (Math 302), Linear Algebra and Differential Equations (Math 307), University of Hawai'i at Manoa, USA.

Summer 2015

- Accelerated Graduate Course on Geometric Optimal Control with Applications, Problem Solving Sessions, Institute of Mathematics for Industry, Fukuoka, Japan.

Spring 2015

- Introduction to Programming (Math 190), Calculus II (Math 242), Introduction to Differential Equations I (Math 302), Numerical Analysis (Math 407), University of Hawai'i at Manoa, USA.

Fall 2014

- Precalculus: Elementary Functions (Math 134), Precalculus: Trigonometry, Analytic Geometry (Math 140, online course), Introduction to Programming (Math 190), Introduction to Differential Equations I (Math 302), University of Hawai'i at Manoa, USA.

Spring 2014

- Precalculus: Trigonometry, Analytic Geometry (Math 140, online course), Introduction to differential Equations I (Math 302), Calculus III (Math 243), University of Hawai'i at Manoa, USA.

Fall 2013

- Introduction to programming (Math 190), Calculus II (Math 242), University of Hawai'i at Manoa, USA.

Spring 2013

- Introduction to programming (Math 190), Linear Algebra and Differential Equations (Math 307), Numerical Analysis II (Math 408), University of Hawai'i at Manoa, USA.

Fall 2012

- Survey of Mathematics (Math 100), Introduction to Programming (Math 190), University of Hawai'i at Manoa, USA.

2010/2011

- Computer Algebra System (Second year of B.S in mathematics), Tutorial of mathematics (First year of B.S in Computer Science), University of Burgundy, France.
- Oral tests, post-secondary preparatory school, Carnot High school, Dijon, France.

2009/2010

- Probability theory, ESIREM engineering school, University of Burgundy, France.
- Computer Algebra System (Second year of B.S in Mathematics), University of Burgundy, France.
- Oral tests, post-secondary preparatory school, Carnot High school, Dijon, France.

2008/2009

- Computer Algebra System (Second year of B.S in Mathematics), University of Burgundy, France.

Grants and Awards

Modeling and Optimization of the Impact of Fragmentation on the Amyloid Assembling Processes. Division Of Mathematical Sciences, Applied Mathematics, National Science Foundation. Co-Principal Investigator. (Submitted in November 2015, Review in process).

Nominations for an Excellence in Teaching Award , December 2014 and December 2015, University of Hawai'i at Manoa, USA.

CNRS/Burgundy Council grant for PhD funding, November 2007-October 2010.

Merit scholarship from the French Government, October 2006.

Community service

Curriculum Committee, Department of Mathematics, University of Hawai'i at Manoa, USA.

Reviewer for Acta Mathematica and Mathematics for Industry, Springer-Verlag, Japan.

Organization of the mathematics session of the Conference of the graduate studens from the Universities of Dijon and Besancon (Dijon, 2009).

Workshop facilitations during scientific popularization events: "Reach for the stars" (space exploration, Honolulu, 2014), "The Monte-Carlo Night" (Introducing teenagers to math thinking, Honolulu, 2013), "Be a scientist night" (Education of homeless childrens in math and science, Honolulu, 2012).

Miscellaneous

Languages

- French (Native speaker), English (fluent), Spanish (basic knowledge).

Computer skills

- Matlab, Fortran, C, COMSOL Multiphysics, Caml, Maple, html, Unix systems, Windows.

Sports

- Rugby, scuba diving (certified), hiking, soccer, surf.

Associative/Humanitarian experience

- Member of the association "Etudes et chantiers" (2005-2006). International volunteer work camps: archeology volunteer work (Paestum, Italy, July 2005), urban planning volunteer work (Agadir, Marocco, August 2006).
- Member of the association "Megaptera" (2007). Study and protection of marine mammals. Master's research internship: recording and mathematical modeling of humpback whale songs (Sainte-Marie, Madagascar, August 2007).
- Vice-president of the student association "Lato Sensu Dijon" (2009-2010). France-Senegal cultural cooperation. Humanitarian mission (Dakar and Louga, Senegal, August 2009).

Acting

- Non-professional acting, Théatre de la Tete Noire, Orléans, France (2002-2007)