Sébastien Briot

Curriculum Vitae

Personal information

Birth date	1981-08-04 (37 years old).
	Married and father of two sons (6 and 8 years old)
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	1 rue de la Noë, BP 92101, 44321 Nantes Cedex 03 – France
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Actual job

Since 2009	Full-time CNRS researcher (CNRS Section 07) at the "Laboratoire des Sciences du Numérique de Nantes" (LS2N) – UMR CNRS 6004.

Academic diplomas

HDR	**in Robotics.**
	awarded by the University of Nantes, 2016, January 8
PhD	**in Robotics.**
	awarded by the "Institut National des Sciences Appliquées de Rennes" (INSA), 2007
	Award of the best PhD thesis in 2007 by the French Research Community in Robotics
MSc. deg.	**of Mechanical Engineering.**
	awarded by the University of Rennes, 2004, June
Eng. deg.	**of Mechanical Engineering and Control Systems.**
	awarded by the INSA of Rennes, 2004, June

Cursus

2017–...	**Head of the team ARMEN**, *LS2N*, Nantes.
2009–...	**Full-time CNRS researcher**, *LS2N (ex-IRCCyN)*, Nantes.
2008–2009	**Postdoctoral Fellow**, *funded by the French Région Pays de la Loire*, IRCCyN, Nantes.
2007–2008	**Postdoctoral Fellow**, *Lavoisier schol.*, École de Technologie Sup., Montréal, Canada.
2004–2007	**PhD student**, *scholarship from the French Ministry of Research*, INSA, Rennes.
2003–2004	**Master student**, University of Rennes, Rennes.
1999–2004	**Engineer student**, INSA, Rennes.

Research works and scientific contributions

My contributions are :

- the development of new robot design methodologies
  - bringing to *the design of new robot architectures with improved performance* (for high-speed and high-accuracy robots, robots with drastically reduced energy consumption, aerial robots, etc)
  - including *control-based design performance criteria*
  - for taking into account the *environmental impact* of robots
- the increase of the robot modelling accuracy (by the model identification and the proposition of full robot elastodynamic models)
- the study of the performance of advanced robot controllers (*"hidden robot" phenomenon*) and the transfer to Control communities (visual servoing, control of multi-agent systems) of tools developed by the Mechanical Engineering community.

Publications

Patents	2 international patents, 1 national patent.
Books	Balancing of Linkages and Robot-Manipulators (with V. Arakelian), *Springer, 2015.* Dynamics of Parallel Robots (with W. Khalil), *Springer, 2015*
Book chapters	2 book chapters, 1 chapter in the Springer Encyclopedia of Robotics (2018), 2 chapters for the "Techniques de l'Ingénieur"
Journals	39 articles in peer-reviewed international journals. 3 articles in peer-reviewed national journals.
Conf.	85 articles in peer-reviewed international conferences. 6 articles in peer-reviewed national conferences.

Awards

2017	*For the project RobEcolo :* Best oral presentation at JJCR 2017 (Journées des Jeunes Chercheurs en Robotique).
2017	*For the project RobEcolo :* Best poster presentation at Journées du GDR Sciences du Bois.
2016	Best Std Award Paper Finalist at EuCoMeS 2016 for the paper *"Control-based Design of a Five-bar Mechanism."* (authors : L. Kaci, S. Briot, C. Boudaud, P. Martinet).
2012	Nominated as a "Reviewer that supplied outstanding and timely reviews" by *IEEE Transactions on Robotics.*
2011	Award of the *French Section of the ASME.*
2011	Award of the Young Researcher, *French Région Bretagne*, in the category "Sciences, Technologies and Interdisciplinarités", for year 2011.
2008	Award of the best PhD thesis in 2007 by the French Research Community in Robotics (CNRS GDR Robotique)
2005	Award of the Best Scientific Communication, *17-th International Internet Conference of Young Scientists and Students on Modern Problems of Machinery*, 2005, Moscow, Russia.

Fundings / Supervised projects

2018–2022	French ANR project SESAME, *total : 528 k€, LS2N : 268 k€.* Singularities and Stability of Sensor-based Controllers
2015–2018	Région Pays de la Loire project RobEcolo, *total : 260 k€, LS2N : 216 k€.* Design and Control of a Wooden Industrial Robot

2014–2015	AtlanSTIC project ARMOR-ROB *10 k€*.
2014–2015	International collaboration project French CNRS / Armenian SCS *6 k€*.
2012–2014	Design of a benchmark for high-speed and high-accuracy robotics, Région Pays de la Loire, *156 k€*.
2011–2016	French ANR project ARROW, *total : 823 k€, IRCCyN : 320 k€*. Accurate and Rapid Robots with a large Operational Workspace
2012–2013	International collaboration project French CNRS / Armenian SCS *7 k€*.
2012–2013	International collaboration project French CNRS / Russian Academy of Sciences *7.4 k€*.

Prestige

Editorial boards Since 2018, collection for Springer, *Parallel Robots : Theory and Applications*, Eds. P. Martinet, J.P. Merlet and S. Briot (2 books published).
Since 2017, Associate Editor for the journal IEEE Robotics and Automation Letters (IEEE RA-L).
Associate Editor for the 2016 IEEE International Conference on Robotics and Automation (ICRA 2016).
Since 2015, Member of the International Program Committee for the International Conference on Informatics in Control, Automation and Robotics (ICINCO).

Honors Distinguished by the French Academy of Sciences to be part of the Future Leaders Program during the 2017 STS forum (Science and Technology in Society), Kyoto, Japan (meeting between 140 "Future Leaders" researchers from all around the world – a single one from France –, and 13 Nobel laureates).

Invited talks **IAMPS 2019** "7th International Workshop on Image Analysis Methods in the Plant Sciences", Lyon, *France*, July 2019 (to come).
Bologna University *Italy*, January 2019.
Guanajuato University, *Mexico*, June 2018.
Journées Nationales de la Recherche en Robotique, Biarritz, *France*, Nov. 2017.
Institut Pascal Clermont-Ferrand, *France*, Nov. 2017.
IRISA Rennes, *France*, April 2017.
IFAC WC 2017 Workshop : "Rigidity Theory for Multi-agent Systems Meets Parallel Robots : Towards the Discovery of Common Models and Methods", *Toulouse, France*, Jul. 2017.
ICRA 2017 Workshop : "Recent Advances in Dynamics for Industrial Applications", *Singapore*, May 2017.
LAAS Toulouse, *France*, Jun. 2016.
ICRA 2016 Workshop : "Application of the theoretical background in Parallel Robotics to other research areas", *Stockholm, Sweden*, May. 2016.
ENS Rennes, *France*, Feb. 2015.
Laval University, *Canada*, Jul. 2014.
Russian Academy of Sciences, *Russia*, Sept. 2012.
Tokyo University of Agriculture and Technology, *Japan*, March 2012.
Espace des Sciences de Rennes, *France*, Dec. 2011
Monash University, *Australia*, Nov. 2011.
Journées du GDR Robotique, *France*, Oct. 2008.
Université Laval, *Québec, Canada*, March 2008.
ETS Montréal, *Québec, Canada*, Nov. 2007.

Invitations *Invited researcher* in Guanajuato Univ., Mexico, June 2018.
Invited researcher in Coro lab., *ETS*, Montréal, Canada, July 2014.
Invited researcher in GV lab., *TUAT*, Tokyo, Japan, March 2012.

Research stays	Blagonravov Institute – Russian Academy of Sciences, *Moscow, Russia*, Sept. 2012. Monash University, *Melbourne, Australia*, Nov. 2011.
International Collab.	J.J. Cervantes-Sanchez, *Guanajuato Univ.*, Mexico. *1 PhD std in common.* I.A. Bonev, *ETS*, Montréal, Canada. *8 common journal publications.* V. Glazunov, *Acad. Sc.*, Moscow, Russia. *5 common journal publications* C. Chen, *Monash University*, Melbourne, Australia. C. Gosselin, *Laval University*, Québec, Canada. *1 common journal publication* G. Venture, *TUAT*, Tokyo, Japan.
Reviewer	*for the journals :* **IEEE** Transactions on Robotics (T-RO), Robotics and Automation Letters (RA-L) **ASME** Journal of Mechanical Design, Journal of Mechanisms and Robotics, Journal of Dynamic Systems, Measurement and Control **IFToMM** Mechanism and Machine Theory **IFAC** Control Engineering Practice, Meccanica, CSME Transactions, etc.
Mainstream	« RobEcolo : des robots en bois pour l'industrie de demain ? », April 2017, cultures-ciences.fr « Un robot aux mains liées », *Sciences Ouest, la revue de l'Espace des Sciences*, Dec. 2011, by Céline Duguey.

Organisation of conferences, workshops, etc.

2018	*Main organizer* of the *Summer School on Parallel Robots (PKM 2018)*, Montpellier, France, Sep. 2018.
2018	*Co-organizer* of the *Second Workshop : "Rigidity Theory for Multi-agent Systems Meets Parallel Robots : Towards the Discovery of Common Models and Methods"*, Nantes, France, Nov. 2018.
2018	Member of the organizing committee for the *22nd CISM IFToMM Symposium on Robot Design, Dynamics and Control 2018* (RoManSy'18).
2017	*Co-organizer* of the *IFAC WC 2017 Workshop : "Rigidity Theory for Multi-agent Systems Meets Parallel Robots : Towards the Discovery of Common Models and Methods"*, Toulouse, France, July 2017.
2016	*Main organizer* of the *ICRA 2016 Workshop : "Application of the theoretical background in Parallel Robotics to other research areas"*, Stockholm, Sweden, May 2016.
2016	*Co-organizer* of the *Spring School on Parallel Robots (PKM 2016)*, Montpellier, France, March 2016.
2016	Member of the organizing committee for the *European Conference on Mechanism Science 2016* (EuCoMeS'16).
2014	*Main organizer* of the *European Workshop on Applications of Parallel and Cable-driven Robots*, INNOROBO 2014, Lyon, France, March 2014.
2012	Member of the organizing committee for the *Journées de la Robotique et de l'Automatique 2012* (JRA'12).
2011	Member of the organizing committee for the *Journées Nationales de la Recherche en Robotique 2011* (JNRR'11).

Administrative duties

2017–...	Member of the Web Steering Committee at LS2N.
2017–...	Head of the team ARMEN at LS2N.
2017–...	Deputy head of the transverse research axis "Management of the energy and of the environmental impacts" at LS2N.

2016–…	Member of National Comittee of the Scientific Research (CoNRS), Section 07.
2014–2016	Member of the research prospective committee of IRCCyN.
2012–2014	in charge of the relations between IRCCyN and the French Federation AtlanSTIC.
2012–2013	Scientific leader of the Industrial Robotics theme in the Robotics team.

Participation to jury / selection committees

2018	Reviewer the PhD thesis of Alejandro Suarez Fernandez-Miranda, "*Compliant Aerial Manipulation*", 2018, December, Sevilla, Spain.
2018	Reviewer the PhD thesis of Wissem Haouas, "*Étude et développement de robots parallèles à plateformes configurables pour la micromanipulation dextre*", 2018, Nov. 14, Bensançon, France.
2018	Jury member for the defence of the PhD thesis of Mahmoud Khamlia, "*Contribution à la modélisation et la commande des dirigeables gros porteurs non-conventionels*", 2018, July 11, Évry, France.
2018	Invited jury member for the defence of the PhD thesis of Fabrizio Schiano, "*Bearing-based Localization and Control for Multiple Quadrotor UAVs*", 2018, January 11, Rennes, France.
2016, 2018	Participation to the HCERES committees for the labs Heudiasyc, COSMER, ISIR.
2016, 2017	Jury member for the award of the best PhD thesis of the French Research Group in Robotics (GDR Robotique).
2015	Jury member for the defence of the PhD thesis of Manuk Mkrtchyan, "*Design and Study of Micromanipulators with Elastic Joints and Piezoelectric and Polymer-metal motors*", 2015, Nov. 20, Rennes.
2013–…	Reviewer for the French Research Funding Agency (ANR).
	Reviewer for the Research Funding Agency of Québec (FRQNT).
2012	Jury member for the defence of the PhD thesis of Erol Özgür, "*From Lines To Dynamics of Parallel Robots*", 2012, July 12, Clermont-Ferrand.
2011	Member of the selection committee for the Robotics and Cognitive Sciences chair, University of Cergy-Pontoise.

Participation to recent projects

2018–2021	Project RFI AtlanSTIC2020 RAPID, *Formation of Heterogeneous Aerial Robots for Explorations with Variable Dynamics.*
2017–2020	Project RFI AtlanSTIC2020 PROMPT, *Performance of Manufacturing Robots in Task Perception.*
2014–2015	Project Région Pays de la Loire RobEcolo, *Design and Control of a Wooden Industrial Robot.*
2014–2015	Project AtlanSTIC ARMOR-ROB, *Visual Servoing of Dual-arm robots.*
2014–2015	Project CNRS / Armenia for scientific collab., *Development of new wearable walking assist devices with bodyweight support.*
2013–2015	Project IRT Jules Verne, *Dry Fiber Placement.*
2011–2016	Project ANR ARROW, *Accurate and Rapid Robots with a Large Operational Workspace.*
2012–2013	Project CNRS / Russian Acad. of Sciences for scientific collab., *Optimal Design and Motion Planning for Parallel Robots in the Neighbourhood of Singularities.*
2012–2013	Project CNRS / Armenia for scientific collab., *Conceptual design and development of new devices for rehabilitation and facilitation of human body motive functions.*

2011–2012 Project PHC FAST, *Development of a novel transparent 6-DOF haptic interface for robotic surgery.*

2010–2014 Project ANR COROUSSO, *Optimal design and control of robots for friction steer welding.*

2010–2012 Project FUI IRIMI, *Optimal design and control for 3D imaging.*

Co-supervision of PhD students

2018–... *Design of a new five-degrees-of-freedom high-speed parallel robot.* Valentin Le Mesle (*Main thesis advisor*).

2018–... *Optimal design of high-speed cobots.* Guillaume Jeanneau (*Main thesis advisor*).

2018–... *Topology optimization of reactionless robots.* Emmanuel Ayala (*Co-thesis advisor*).

2017–... *Control-based design of robots.* Minglei (Éric) Zhu (*Main thesis advisor*).

2016–... *Design of high-speed robots with drastically reduced energy consumption.* Rafael Balderas Hill (*Main thesis advisor*).

2015–2018 *Design and control of an industrial wooden robot.* Lila Kaci (*Main thesis advisor*). Now temporary assistant professor at FEMTO-ST.

2015–2018 *Design and control of a flying parallel robot.* Damien Six (*Main thesis advisor*). Now Postdoctoral fellow at IIT Genoa.

2015–2018 *Optimal motions and advanced control of parallel robots for their operation mode changing.* Adrien Koessler. Now Postdoctoral fellow at the Institut Pascal.

2012–2015 *Sensor-based design and advanced control of high-speed parallel robots.* Victor Rosenzveig. Now Software Engineer in the company Capgemini.

2011–2015 *Modeling and control of reconfigurable parallel robots.* Georges Pagis. Now Research Engineer in the company MG-Tech.

2010–2013 *Analysis and design of a new parallel robot with 2-DOF for pick-and-place operations.* Coralie Germain. Now Assistant Professor at Ecole Normale Supérieure Cachan Bretagne, France.

Co-supervision of Master students

2019 *Making aggressive maneuvers with drones thanks to parallel singularity crossing approaches.* Marco Orsingher.

2018 *Visual servoing of a wooden industrial robot.* Pauline Lafoux.

2018 *Modeling and optimization of an underactuated gripper for high-speed grasping of objects.* Guillaume Jeanneau.

2017 *Motion planning and control of a flying parallel robot.* Zhongmou Li.

2017 *Design of exploration robots with reduced energy consumption.* Matthieu Furet.

2017 *Dynamic grasping of objects with a high-speed parallel robot.* David Llevat-Pamiès.

2016 *Visual servoing of a high-speed parallel robot.* Muhammad Tufail.

2016 *Definition of an active deformation model for the manipulation of soft tissues.* Vyshakh Palli-Thazha.

2016 *Automatic dynamic reconfigurability of parallel robot by crossing Type 2 singularities.* Rafael Balderas Hill.

2015 *Modelling and design of a robot made of wooden links.* Abhilash Nayak.

2014 *Visual servoing of the Monash Epicyclic-Parallel Manipulator.* Alessia Vignolo.

2014 *Changing operation modes of parallel robots through constraint singularity crossing.* Josselin Briand.

2013	*Stiffness Analysis of 2-DOF Translational Parallel Manipulators : Determination of an Intrinsic Stiffness.* Marteen Samuel.
2012	*Sensitivity analysis of the IRSBot-2 robot.* Yingcong Deng.
2012	*Analysis of the performances of serial robots with 4-DOF based on RPaR orthogonal architecture.* Miguel Morales-Gonzalez.
2012	*Conceptual design and analysis of 2-DOF parallel robot.* Latifah Nurahmi.
2011	*Creation of an optimal motion generator for minimizing the vibrations of a new high-speed robot with 2 DOF.* Cornelius Barnard.
2011	*Analysis of the dynamic performances of serial 3R orthogonal robots.* Dinh-Quan NGuyen.
2010	*Analysis and design of a new parallel robot with 2-DOF for pick-and-place operations.* Coralie Germain.
2009	*Shaking force minimization of high-speed robots.* Nayelli Sauvestre.
2005	*Modeling, design and optimization of a new parallel manipulator with 3-DOF.* L. Delion and B. Levillain.
2004	*Design and optimization of the base of the PAMINSA manipulator, and design of a mock-up.* C. Biris, W. Desrivières and A. Pouradier-Duteil.

Teaching activities

2016–...	Lecture of *Dynamic Modeling of Serial Robots*, M.S. degree, Ecole Centrale of Nantes.
2016–...	Lecture of *Parallel Robots*, M.S. degree, Ecole Normale Supérieure of Rennes.
2014–...	Lecture of *Advanced Modeling of Robots*, M.S. degree, Ecole Centrale of Nantes.
2014–2017	Lecture of *Optimal Design of Robots*, M.S. degree, Ecole Centrale of Nantes.
2009–2014	Lecture of *Variational Principles*, B.S. degree, Ecole des Mines of Nantes.
2013	Lecture of *Classical Mechanics*, B.S. degree, INSA of Rennes.
2010	Lecture of *Classical Mechanics*, B.S. degree, Ecole des Mines of Nantes.
2004–2007	Lecture of *Classical Mechanics*, B.S. degree, INSA of Rennes.
2004–2007	Lecture of *Mechanics of Deformations*, B.S. degree, INSA of Rennes.
2004–2007	Lecture of *Fluid Mechanics*, MSc. degree, INSA of Rennes.