Curriculum vitae: **Rodolphe SEPULCHRE**
Position: Chair Professor
Department of Engineering
Division of Information Engineering, Control group
CAMBRIDGE UNIVERSITY
https://sites.google.com/site/rsepulchre/

**PERSONAL INFORMATION**
Rodolphe SEPULCHRE
[redacted]

- **EDUCATION**

| | | |
|---|---|---|
| 1994 | PhD in Control engineering | Université catholique de Louvain, Belgium |
| 1990 | Engineering degree (highest honors) | Université catholique de Louvain, Belgium |
| 1990 | Bachelor degree in Philosophy | Université catholique de Louvain, Belgium |

- **CURRENT POSITIONS**

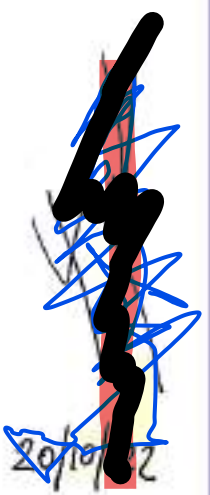
2021-2022 Deputy Head of Research, Department of Engineering, University of Cambridge, UK.
2013 - Professor of Engineering, Department of Engineering, University of **Cambridge, UK**.
2013- Extraordinary Professor, Department of EE&CS, Université de Liège, Belgium.

- **PREVIOUS POSITIONS**

2018 : Visiting scholar at California Institute of Technology (11/2018)
2011: Invited professor at **Mines Paris-Tech**, France (3 months).
2012–2013: **Founding director of Orchestron** team, INRIA-Lille Europe.
1998–2013: Professor of Automatic Control, Departement of EE&CS, University of Liège, Belgium. (1998: Assistant Professor; 2001: Associate Professor; 2005: Full Professor).
2009-2010: Invited professor at **Mines Paris-Tech**, France (3 months).
2001-2011: Invited professor at the Université catholique de Louvain, Belgium.
2002-2003: Visiting scholar, Department of Mech. Engineering, **Princeton University**, USA.
1995-1997: Research Fellow of the FNRS, Université catholique de Louvain, Belgium.
1994-1996: Postdoctoral research associate, **University of California, Santa Barbara**, USA.

- **FELLOWSHIPS AND AWARDS**

2022: Distinguished Israel Pollak Lecturer for the academic year 2022-2023.
2022: ERC Advanced Grant SpikyControl (2,5 MEUR, 2022-2027).
2021: CDC Outstanding Student Paper Award for paper co-authored with Phd student Chaffey.
2021: ECC Best student paper award for paper co-authored with Phd student Chaffey.
2020: IEEE CSS George S. Axelby Outstanding Paper Award.
2020: Fellow of the International Federation of Automatic Control (IFAC).
2019 : Kokotovic Distinguished Visiting Professor at University of California, Santa Barbara (02/2019).
2015: ERC Advanced Grant Switchlet (2,5 MEUR, 2015-2020).
2015: Fellow of the Society for Industrial and Applied Mathematics (SIAM).
2014: **Belgian Francqui Chair** at Université catholique de Louvain
(Prestigious Belgian award for a series of public lectures)
2013: Elected at the Royal Academy of Belgium (Science and Technology).
2013: Wolfson Research Merit Award from the Royal Society, UK.
2009: IEEE Fellow for contributions in nonlinear systems.
2009: IEEE Control Systems Society Distinguished lecturer.
2008: IEEE Control Systems Society **Antonio Ruberti young researcher prize.**
(Major international award of the field, given annually to a researcher under 40).
1994: Fellow of the Belgian American Education Foundation.



- **SCHOLARLY EDITORIAL ROLES**

**2020- : Editor-in-Chief, IEEE Control Systems (Magazine).**
2015- : Associate Editor of Annual Reviews in Control, Robotics, and Autonomous Systems.
2014-2017 : Associate Editor of IEEE Transactions on Network Science and Engineering.
**2009-2018 : Editor-in-Chief of Systems and Control Letters.**
2009-: Associate Editor for the Journal of Control and Calculus of Variations.
2008-2010: Associate Editor of Journal of Nonlinear Science.
2007-2012: Associate Editor of SIAM Journal of Control and Optimization.
1999-2002: Associate Editor of Automatica.
1999- : Associate Editor of Mathematics of Control, Signals, and Systems.

- **INSTITUTIONAL RESPONSIBILITIES**

2021-2022: Deputy Head of Research, Department of Engineering, University of Cambridge. Chair of Departmental Research Committee.
2021-2022: Chair of Mathematical & Computing Subject Group; Member of faculty board; member of the Council of the School of Technology.
2015-2018 : Member of Faculty Board ; Member of probation committee ; member of college council.
2016-2018 : Chair of Information Engineering Subject Group
2004-2013: **Founding director of the research unit** "Systems and modeling" (about 60 people)
2009-2011: **Chair of the Department** of EE&CS, Université de Liège, Belgium (about 200 people).
2005-2009: Member of the central R&D board, Université de Liège.
2005-2012: **Founding director of the Biomedical Engineering Degree**, Université de Liège.

- **PROFESSIONAL SERVICE**

2022: Evaluation Panel Member of the Department of Mechanical Engineering at ETH Zurich
2022: Member of IFAC Award Committee for High Impact Paper Award.
2022: Member of EUCA Council
2021- : Review Panel Member of NCCR Automation, Zurich.
2020: 24th MTNS **Program Chair**, Cambridge, UK (cancelled conference).
2020: Chair of IFAC Award Committee for Best paper published in Automatica (2017-2020).
2019: 58th IEEE Conference on Decision and Control **Program Chair**, Nice, France.
2013: Member of the INRIA evaluation panel of candidates to the DR2 (research director) competition.
2009: Coordinator of the international panel for the evaluation of the theme "Modeling, Optimization and Control of Dynamic Systems" at INRIA.
2001-2009: Vice-chair of IEEE Technical Committee on Nonlinear Control
2006-: Member of the IFAC Technical Committee on Nonlinear Systems.
2006: Member of the FCT (Portuguese research foundation) evaluation panel for research projects in Electrical Engineering.
1999-2001: Member of the administrative council of European Control Association.

- **COMPETITIVE GRANTS**

ERC Advanced Grant "SpikyControl". 2022-2027. (2,5 M Eur).
ERC advanced grant "Switchlets". October 2015 - September 2020 (2,5 M Eur).
Node leader of the Belgian federal research network "Dynamical ystems, control and optimization". Apr 2012 - Dec. 2017. (Local funding: 500 kEUR).
Project ARC "Cognitive and neural dynamics of the resting brain in health and disease". Oct 2012-Dec 2017-- Coordinator: S. Laureys (ULG) (Local budget: 177.240 EUR).
Project ESO (European Southern Observatory). Evaluation of control strategies for the primary mirror of the giant telescope E-ELT. (Budget : 80.000 EUR).
Project ARC COG-SLEEP-GWA "Déterminants génétiques humains des variations de performance cognitives, du sommeil et de la résistance à la privation de sommeil ". Oct. 2009- Sep. 2014. (Local budget : 177.240 EUR).
Node leader of project FRFC 2.4585.12 "Nonsmooth optimization on manifolds". Jan 2012- Dec. 2015.
Node leader of the Belgian federal research network "Dynamical systems, control and optimization". Jan

2007 - Dec. 2011. (Local funding: 400 kEUR).
European Nonlinear Control Network TMR ERB FMRXCT-970137. Dec. 97- Dec. 01.
European Project "Advanced Transmission and Oil System Concepts" G4RD-CT-2000-00391. Jan. 2001 - Jan 2004.
Control Training Site Multi-partner Marie Curie training site. Jan. 2002 - Dec. 2006.
Node leader of the Belgian federal research network "Dynamical systems and control: computation, identification, and modelling". Jan 2002 - Dec. 2006. (Local budget: 375.000 EUR).
Member of HCYON European network of excellence "Hybrid control: taming heterogeneity and complexity of networked embedded systems". Sept 2004- Sept 2008.

## • SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

Since 1997, I have supervised 26 PhD students (24 completed and 2 ongoing) and 19 postdoctoral fellows. Eight of my former PhD students have a permanent academic position and an established international profile, in scientific areas and institutions that span of range of research areas: F. Grognard (nonlinear control, INRIA Sophia-Antipolis, F), P.-A. Absil (optimization, U. Louvain, B), R. Ronsse (rehabilitation robotics, U. Louvain, B.), G.-B. Stan (synthetic biology, Imperial College, UK), A. Sarlette (quantum control, INRIA Paris, F), A. Mauroy (mathematics, U. Namur, B.), G. Drion (neuroengineering, U. Liege, B.), P. Sacre (neuroengineering, U. Liege, B.).
Nine of my former postdoctoral collaborators have secured a permanent academic position: H. Van Waarde (U. Groningen, The Netherlands), Ch. Grussler (Technion, Israel), F. Miranda (INRIA Grenoble, F.), A. Franci (UNAM Mexico), S. Bonnabel (Mines Paris-Tech, F), L. Scardovi (U. Toronto, C), M. Zorzi (U. Padova, I), E. Tuna (Middle-east University, Turkey), D. Efimov (INRIA Lille, F).

**Former PhD Students:**

Thomas **Chaffey**, Input-Output Analysis: Graphical and Algorithmic Methods, University of Cambridge, April 2022. (Junior Research Fellow at Pembroke College)
Thiago **Burghi**, Feedback identification of neuronal systems, University of Cambridge, 2019. (Postdoctoral researcher, University of Cambridge)
Tomas **Van Pottelberghe**, Integrate-and-fire modelling of neuronal systems with modulatory properties, University of Cambridge, 2019. (Data Scientist at Unit8, Switzerland).
Luka **Ribar**, Synthesis of neuromorphic circuits with neuromodulatory properties, University of Cambridge, 2019. (Research Scientist at GraphCore, London, UK).
Ilario **Cirillo**, Nonlinear resonance and excitability in interconnected systems, University of Cambridge, 2019. (Research Scientist at Mathworks, Cambridge, UK).
Cyrus **Mostajeran**, Invariant Differential positivity, University of Cambridge, 2017.
Julie **Dethier**, The role of feedback in maintaining robustness and modulation across scales: Insights from cellular and network neurophysiology, Université de Liège, 2015. (Consultant at Boston Consulting Group, Washington, USA).
Raphaël **Liégeois**, Dynamic modelling from resting-state brain imaging, Université de Liège, 2015. (Postdoctoral Researcher, EPFL, Switzerland).
B. **Mishra**, A Riemannian approach to constrained least-squares with symmetries, Université de Liège, 2014. (Now Researcher at Microsoft Research, Bangalore).
A. **Collard**, Geometric statistical processing of brain diffusion tensor images. Université de Liège, 2013.
L. **Trotta**, Analysis of performance and robustness of biological switches. Université de Liège, 2013.
P. **Sacré**, Systems analysis of oscillator models in the space of phase response curves. Université de Liège, 2013. (Now Professor at the University of Liege, Belgium).
G. **Drion**, Regulation of Excitability, Pacemaking, and Bursting : Insights from Dopamine Neuron Electrophysiology. Université de Liège, 2013. (Now Professor at the University of Liege, Belgium).
G. **Meyer**, Geometric optimization algorithms for linear regression on fixed rank matrices. Université de Liège, 2011.
A. **Mauroy**, On the collective dichotomic behaviors of large populations of pulse-coupled firing oscillators. Université de Liège, 2011. (Now Professor at the University de Namur, Belgium).
M. **Journée**, Geometric algorithms for component analysis with a view to gene-expression analysis. Université de Liège, 2009. (Researcher at the Institut Royal Météorologique, Belgium).
A. **Sarlette**, Geometry and Symmetries in Coordination Control. Université de Liège, 2011. (INRIA researcher in Paris and Assistant professor at Universiteit Gent, Belgium).

20/10/22

Ch. **Germay**, Modeling and Analysis of Self-Excited Drill Bit Vibrations. Université de Liège, 2009. (Managing and founding director of Epslog SA).
R. **Ronsse**, Rhythmic movements control : Parallels between human behavior and robotics, Université de Liège, 2007. (Assistant Professor at Université catholique de Louvain, Belgium).
M. **Gérard**, Dynamics and control of juggling, Université de Liège, 2005. (KPNG Consulting, Luxembourg).
G. **Stan**, Global analysis and synthesis of oscillations : a dissipativity approach, Université de Liège, 2005. (Reader, Imperial College, London, UK).
PA. **Absil**, Invariant Subspace Computation : A Geometric Approach, Université de Liège, 2003. (Associate Professor at Université catholique de Louvain, Belgium).
W. **Michiels**, Stability and stabilization of time-delay systems, Katholieke Universiteit Leuven, 2002 (co-promotor). (Associate Professor at Katholieke Universiteit Leuven, Belgium).
F. **Grognard**, Control of constrained systems : closed-loop, open-loop, and hybrid solutions. Université catholique de Louvain, 2001 (co-promotor). (Researcher INRIA, Sophia-Antipolis, France).

**Former postdoctoral collaborators:**

Jin Gyu **Lee** (PhD2018, Seoul National University) Cambridge 2019-2021. (Now postdoctoral researcher at Imperial College, London, UK).
Felix **Miranda** (PhD2013, Cinvestav Mexico) Cambridge, 2017-2020. (Now INRIA Researcher, Grenoble, France)
Alberto **Padoan** (PhD2013, Imperial College London) Cambridge, 2017-2021. (Now postdoctoral researcher, ETH Zurich)
Christian **Grussler** (PhD2016, University of Lund) Cambridge, 2016 -2019. (Now Assistant Professor Technion, Israel)
Cyrus **Mostajeran** (PhD2013, University of Cambridge) Cambridge, 2016 -2018. (Now Senior Research Scientist, NTU Singapore)
Marko **Seslija** (PhD2014, University of Groningen) Cambridge, 2016 -2018. (Now Freelance Data Scientist, Oxford, UK).
Biswa **Sengupta** (PhD2013, University of Cambridge) Cambridge, 2016-2017. (Now Managing Director, JP Morgan, London, UK).
F. **Carli** (Ph.D. 2011, University of Padova). Université de Liège, 2014-2015. (Teaching Position, Padova, Italy).
M. **Claeys** (Ph.D. 2013, LAAS Toulouse). University of Cambridge, 2013-2014. (Now Control Engineer, Brussels, Belgium).
M. **Zorzi** (Ph.D. 2013, University of Padova). Fonds National de la Recherche Scientifique, 2013-2014. (Now Assistant Professor at Padova University).
A. **Franci** (Ph.D. 2011, Supelec Paris). Université de Liège, 2012-2015.
F. **Forni** (Ph.D. 2009, University of Roma). Université de Liège, 2011-2015.
A. **Mauroy** (Ph.D. 2011, Université de Liège). Université de Liège, 2013-2015.
Ch. **Lageman** (Ph.D. 2001, Wurzburg University). - Université de Liège, 2008-2009. (Researcher Würzburg University, Germany).
D. **Efimov** (Ph.D. 2001, St Petersburg State Electrical Engineering University). Université de Liège, 2008-2009. (Researcher INRIA-Lille, France).
S. **Bonnabel** (Ph.D. 2007, Ecole des Mines de Paris, France). Université de Liège, 2007-2008. (Associate Professor Mines-Paris Tech, France).
Emre **Tuna** (Ph.D. 2005, University of California, Santa Barbara, USA). Université de Liège, 2006-2007. (Professor MiddleEast University, Turkey).
Luca **Scardovi** (Ph.D. 2005, University of Genoa, Italy). Université de Liège, 2005-2006. (Assistant Professor University of Toronto, Canada).

20/10/22

- **KEYNOTES, PLENARY LECTURES, and SELECTED PRESENTATIONS**

2022: NeuroTech tutorial (available on YouTube)
2022: Keynote Speaker at 9th International Conference of Control, Dynamic Systems, and Robotics (CDSR'22)

2021: Joint plenary speaker at SIAM Annual meeting and SIAM Conference on Control and Its Applications, Vancouver, Washington.
2020 : Control theory of switches and clocks. Plenary Lecture. 32nd Chinese Conference and Decision Conference, May, Hefei, China.
2019: Neuromorphic control of a neuromorphic circuit. Telluride neuromorphic workshop 2019, July, Telluride, Colorado.
2019: Differential nonlinear control. Five lectures at UCSB, California, as Petar Kokotovic Distinguished Visiting Professor.
2018: Positive feedback regulation. Invited presentation at LCCC workshop on learning and adaptation for Sensorimotor control. October, Lund, Sweden.
2018: Cybernetics. Sidney Greats Lecture. Sidney Sussex College, October, Cambridge.
2018 : Control across scales, by positive and negative feedback. Plenary Lecture. 58th IEEE Conference on Decision and Control, December, Miami, Florida.
2018 : Sync or Swing ? Plenary Lecture. 5th IFAC Conference on Analysis and Control of chaotic systems, November. Eindhoven.
2018 : Control theory of switches and clocks, Plenary Lecture. European Control Conference, June, Limassol, Cyprus.
2018: Distances in cones. Invited lecture at Oberwolfach Workshop on Nonlinear Data : theory and algorithms, April .Oberwolfach, Germany.
2017: Three lectures on "simplicity and complexity of neurophysiological behaviors", 2nd ICMS Winter School on Complex Systems, January, Eindhoven.
2016: Differential analysis of nonlinear systems. Plenary Lecture. Congreso Nacional de Control Automatico, 28 September, Mexico.
2015: The impact of Maxwell's paper "On governors". *Celebrating Maxwell's genius and legacy*, Royal Society of Edinburgh, November.
2015: *Local methods for nonlocal science and engineering*, Belgian Francqui Chair at Université catholique de Louvain, Belgium (6 lectures).
2015: *Feedback: a zooming principle*, IEEE UK & Ireland Control Systems Society Chapter Guest Lecture, Oxford. Also presented at IMA workshop Minneapolis (September) and ETH Zurich (October).
2014: Plenary, *Multiresolution feedback systems*, 21st International Symposium on Mathematical Theory of Networks and Systems, Groningen, The Netherlands.
2014: Plenary, *Do brains compute?* TedX Liège talk.
2013: Plenary, *Orchestrons : neuronal rhythms as open systems*, 32th Benelux meeting on Systems and Control, Houffalize, Belgium.
2012: Plenary, *Local methods for non-local predictions in systems and control*, 1st International Conference on Systems and Computer Science, Lille, France.
2012: Plenary, *Contraction analysis and port-hamiltonian modeling*, 4th IFAC Workshop on Lagrangian and Hamiltonian Methods for Non Linear Control, Bertinoro, Italy.
2010: Plenary, *Consensus in nonlinear spaces*, 8th IFAC Symposium on Nonlinear Control Systems, Bologna, Italy.
2010: Plenary, *La géométrie des matrices positive semi-définies de rang fixé : un peu de théorie et beaucoup d'applications*, 5th Congrès International Francophone d'Automatique, Nancy, France.
2009: Colloquium "le modèle et l'algorithme", *La géométrie a rendez-vous avec les systèmes distribués*, INRIA-Rocquencourt, France.
2009: Invited lecture, *Consensus, coordination, and synchronization*, Summer Research Institute, Lausanne, EPFL, Switzeland,
2009: Colloquium, Algorithmic challenges in an information-rich age, INRIA Grenoble, France.
2008: Plenary lecture, *Consensus, coordination, and synchronization*, European Dynamic Days 2008, Delft, The Netherlands.
2008: *Consensus, coordination, and synchronization*, a series of five lectures at the Indian Institute of Technology, Bombay, India.
2007: *Consensus on manifolds*, a series of two lectures at the Summer school on Optimization and Control, Thurnau, Germany.
2006: Plenary lecture, *Consensus optimization on manifolds*, Interuniversity Attraction Pole V/22 in Systems and Control, Leuven, Belgium.
2004: Semi-plenary lecture, *Dynamics and control of bounce juggling*, semi-plenary lecture, 16th International Symposium on Mathematical Theory of Networks and Systems, Leuven, Belgium.
2004: Plenary lecture, *Oscillators as systems and synchrony as a design principle*, first Control Training Site workshop, Coimbra, Portugal.

2004: Semi-plenary lecture, *Dynamics and control of bounce juggling*, 6th IFAC Symposium on Nonlinear Control Systems, Stuttgart, Germany.
2004: Plenary lecture, *Oscillators as systems and synchrony as a design principle*, Interuniversity Attraction Pole V/22 in Systems and Control, Ghent, Belgium.

## • INTERNATIONAL WORKSHOPS, TUTORIALS, AND GRADUATE SCHOOLS

ECC Tutorial on Scaled Relative Graphs, London, July 2022.
Control Across Scales. Cambridge. March 10-12, 2020. 30 participants.
ECC Tutorial "Control by neuromodulation", Naples, July 2019.
EECI Graduate School, Neuromorphic Control, Paris, January 2019. 30 participants
EECI Graduate School, Nonlinear Control, Padova, April 2017. 30 participants.
Biological Control Across Scales. Cambridge. June 28-29, 2016. 30 participants.
IEEE 54th CDC Tutorial on "Neuronal Behaviors: a Control Perspective", Osaka, Japan 2015.
EECI Graduate School, Nonlinear Control, Paris, April 2015. 30 participants.
Workshop on contraction. Louvain-La-Neuve, Belgium. October 10, 2012. 40 participants.
Optimization on manifolds. Paris, France. February 2011. EECI graduate school. 20 participants.
28th Benelux Meeting in Systems and Control. Spa, Belgium. March 2009. 240 participants.
Optimization on manifolds, Grenoble, France. September 2008. International summer school. Organisation: R. Sepulchre and P.-A. Absil. 40 participants.
Optimization on manifolds, New-Orleans, USA. December 2007. IEEE 46th Conference on Decision and Control. Pre-conference tutorial workshop. Organisation: P.-A. Absil, K. Hüper, and R. Sepulchre. (25 participants)

## • PUBLICATIONS

(All available from personal webpage; citations data from Google Scholar, June 2022)
2 monographs (over 3000 citations since 2008 and 2750 citations since 1997, respectively).
Over 110 journal articles, (29 with more than 100 citations).
117 internationally peer reviewed conference papers and 13 book chapters.
Over 20400 total citations; H-index=56; 2 patents.

20/10/'22