Christophe Trefois

PhD, Dipl.-Ing.

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 Trefex
Date of birth: May 1, 1984

Education

2010–2014

PhD in Systems Biomedicine, *Luxembourg Centre for Systems Biomedicine (LCSB) – University of Luxembourg*, Luxembourg, *very good*
Advisor: Prof. Dr Rudi Balling

2006–2008

Master of Science in Communication Systems, *Ecole Polytechnique Fédérale de Lausanne (EPFL)*, Lausanne, 5.32/6
Advisor: Prof. Jean-Pierre Hubaux

2003–2006

Bachelor of Science in Communication Systems, *Ecole Polytechnique Fédérale de Lausanne (EPFL)*, Lausanne
Advisor: Prof. Dr Patrick Thiran

1996–2003

Baccalauréat scientifique (Section B), *Lycée Athénée de Luxembourg*, Luxembourg, *cum laude*

PhD dissertation

title   *Detection and characterization of critical transitions in mitochondrial activity via high content screening*

supervisors   Prof. Dr Rudi Balling and Dr Paul Antony

description   Critical transitions exist in many dynamical systems, ranging from the Earth's climate system to microcosm populations. During a critical transition, the state of a dynamical system abruptly changes from one stable state to another, typically without obvious prior warning. In this thesis, we set out to study critical transitions in a simple cellular model using mitochondrial membrane potential as readout. To identify critical transitions, we established a modular high-content screening platform allowing systematic perturbation of oxidative phosphorylation. We showed that critical transitions are an intrinsic property of cellular systems and that two-component Gaussian mixture models adequately describe critical transitions dynamics.

url   `http://orbilu.uni.lu/handle/10993/17706`

Master thesis

title   *Secure integration of wireless sensor networks into application*

supervisors   Prof. Jean-Pierre Hubaux and Laurent Gomez

description	Performed a risk analysis on integrating wireless sensor networks with business applications using NIST SP 800-30. We analyzed a security scheme which does not rely on complex operations guaranteeing end-to-end confidentiality of sensor data and provided both an *in silico* software demonstration and a hardware validation using physical components.
url	`http://infoscience.epfl.ch/record/161912`

Experience

Vocational

2014

Research associate, *University of Luxembourg (LCSB)*, Luxembourg

Leading a change management initiative around reproducible science for the institute (~200 people) in the bioinformatics core group led by Dr Reinhard Schneider.
Main activities include:

- Setup and coordination of core virtualization platform for the LCSB for ~200 virtual machines;
  - Technologies: OpenStack, Puppet, Foreman, freeIPA, Icinga 2, Xen.
- Creating data infrastructures for various data types of research labs;
  - Standardizing storage of 300 TiB for microscopic images, spectograms, genomics and life science related experimental data.
- Setting up research best practises and training for researchers in the form of workshops;
- Establishing policies on data management.

2017

LTS Lead Coach, *Luxembourg Tech School*, Luxembourg

Lead coach for three high schools in the Luxembourg Tech School project. Coaching high school students in their 1-3 final years of high school to help them become the future digital leaders. Managing the teaching platform. `www.techschool.lu`

2016–2017

LTS Coach, *Luxembourg Tech School*, Luxembourg

Coaching high school students in their 1-3 final years of high school to help them become the future digital leaders. Managing the teaching platform. `www.techschool.lu`

2015

IT Consultant, *IT for Translational Medicine (ITTM)*, Luxembourg

Providing various consulting services around IT and medical IT with a focus on strategy, security and IT architecture.

2010–2014

PhD candidate, *University of Luxembourg (LCSB)*, Luxembourg

Obtained PhD and contributed to building up a new institute in the experimental neurobiology group led by Prof. Dr Rudi Balling.
Contributions to the institute included:

- Establishing an automated high content screening platform;
- Setting up a microscopic imaging database (OMERO);
- Setting up a laboratory information management system (LIMS) for tracking samples.

2008–2010

Senior IT auditor and consultant, *Ernst & Young*, Luxembourg

Worked in the IT risk & and assurance team for various national and international clients.
Activities included:

- IT effectiveness, cost optimization and service management;
- Risk assessment and modeling;
- Business process improvement;
- IT general controls, operations and infrastructure diagnostics;
- Change management audits, logical and physical access control security audits.
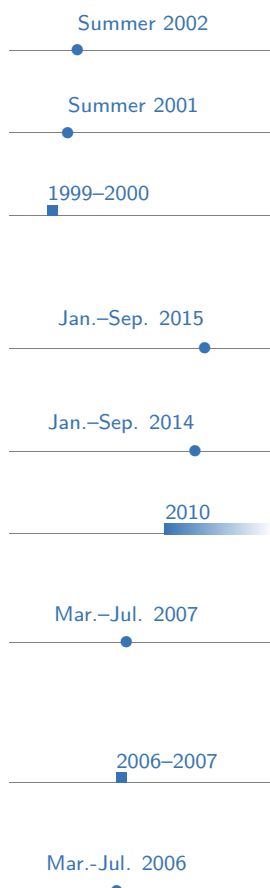
Feb.–Aug. 2008

Research assistant, *SAP Labs France*, Sophia Antipolis, France

Research assistant in the security and trust department of SAP Labs France. This work resulted in my Master thesis.

Aug. 2007

Software developer, *Ecole Polytechnique Fédérale de Lausanne*, Switzerland

Development of a template based website using Groovy, Ajax, Java and HTML/CSS.

Web developer, *Web Technologies*, Luxembourg
Development of a PHP based holiday planner for employees.

Web developer, *Web Technologies*, Luxembourg
Development of an eCommerce platform.

Fund support, *State Street Bank*, Luxembourg
Distribution of mail, sorting of print outs from various funds during two summer internships.

Teaching

Master thesis supervision, *University of Luxembourg (LCSB)*, Luxembourg
Co-supervision of a master student for the image analysis and programming part of his work.

Master thesis supervision, *University of Luxembourg (LCSB)*, Luxembourg
Supervised a Master student for the computational and theoretical part of his work.

Mendeley advisor, Luxembourg
Organized and presented four workshops for librarians and students on the benefits of using a reference manager with the help of Mendeley.

Teaching assistant, *Ecole Polytechnique Fédérale de Lausanne*, Switzerland
Information and technology project course – Bachelor in communication systems. Helping students on their assignments and supervising groups of 2 students for their java programming project.

Teaching assistant, *Ecole Polytechnique Fédérale de Lausanne*, Switzerland
Computer networking course – Bachelor in communication systems. Helping students on their assignments and projects and overseeing exams.

Teaching assistant, *Ecole Polytechnique Fédérale de Lausanne*, Switzerland
Java object oriented programming course – Bachelor in communication systems. Helping students on their assignments, projects, overseeing and correcting exams.

Languages

Luxembourgish	Native	French	Proficient
English	Proficient	German	Proficient

Skills

Languages	Java, Python, C++, C#, Ruby, HTML/CSS
Databases	MySQL, MariaDB, PostgreSQL, MaxDB
Web	PHP, JSON, HAML, YAML, XML, Twitter Bootstrap, WebSockets, Ajax, Groovy
System administration	Puppet, Hiera, Foreman, freeIPA, Icinga 2, Vagrant, Bash
Platforms	OpenStack, oVirt, Gitlab, Docker, OMERO, ownCloud, Joomla CMS
Tools & OS	LaTeX, Visual Code, Git, SVN, Vim, Eclipse, Visual Studio, R, oarsub, (Libre/Microsoft) Office, Windows, Linux (Ubuntu, CentOS), OS X
Laboratory	Cell culture, confocal & spinning disc microscopy, automatic liquid handling robotics, live cell imaging, high performance liquid chromatography
Techniques	Statistics, image analysis, high-performance computing

Activities

Vice-President, *LuxDoc*, Luxembourg
Vice-President of the Luxembourg young researchers association. `www.luxdoc.org`

President, *LuxDoc*, Luxembourg

President of the Luxembourg young researchers association. `www.luxdoc.org`

Percussionist, *Just Music Bartreng*, Luxembourg

Founding member of the music group and played various percussion instruments in a group of 5-8 people. Obtained the Bronze medal for services rendered to the Luxembourgish cultural life. `www.justmusic.lu`

Publications

2018

Herzinger, Sascha, Grouès, Valentin, Gu, Wei, Satagopam, Venkata, Banda, Peter, **Trefois, Christophe**, et al. (Sept. 2018) , *"Fractalis: a scalable open-source service for platform-independent interactive visual analysis of biomedical data"*. In: *GigaScience* 7.9.

2016

Biryukov, M., Groues, V., **Trefois, Christophe**, Satagopam, V., and Schneider, R. (Sept. 2016), *"Semantic web technologies for a knowledge base of biomedical facts extracted from scientific literature"*. *In:* CEUR Workshop Proceedings.

2015

Forster, J. I., Köglsberger, S., **Trefois, Christophe**, Boyd, O., Baumuratov, A. S., Buck, L., et al. (Sept. 2015) , *"Characterization of differentiated SH-SY5Y as neuronal screening model reveals increased oxidative vulnerability"*. In: *Journal of Biomolecular Screening* 21.5, pp. 496–509.

2015

Trefois, Christophe, Antony, Paul MA, Goncalves, Jorge, Skupin, Alexander, and Balling, Rudi (Aug. 2015) , *"Critical transitions in chronic disease: transferring concepts from ecology to systems medicine"*. In: *Current Opinion in Biotechnology* 34.5, pp. 48–55.

2014

Antony, Paul M. A., Boyd, Olga, **Trefois, Christophe**, Ammerlaan, Wim, Ostaszewski, Marek, Baumuratov, Aidos S, et al. (Nov. 2014) , *"Platelet mitochondrial membrane potential in Parkinson's disease"*. In: *Annals of Clinical and Translational Neurology* 34.5, pp. 48–55.

2014

Biryukov, Maria, Antony, Paul MA, Krishna, Abhimanyu, May, Patrick, and **Trefois, Christophe** (Nov. 2014), *"Evaluation of Cell Line Suitability for Disease Specific Perturbation Experiments"*. *In:* Studies in Classification, Data Analysis, and Knowledge Organization. *Springer.*

2014

Fujita, Kazuhiro, Ostaszewski, Marek, Matsuoka, Yukiko, Ghosh, Samik, Glaab, Enrico, **Trefois, Christophe**, et al. (Feb. 2014) , *"Integrating pathways of Parkinson's disease in a molecular interaction map."* In: *Molecular Neurobiology* 49.1, pp. 88–102.

2014

Krishna, Abhimanyu, Biryukov, Maria, **Trefois, Christophe**, Antony, Paul MA, Hussong, Rene, Lin, Jake, et al. (Dec. 2014) , *"Systems genomics evaluation of the SH-SY5Y neuroblastoma cell line as a model for Parkinson's disease."* In: *BMC Genomics* 15.1, p. 1154.

2014

Samsi, Siddharth, **Trefois, Christophe**, Antony, Paul M A, and Skupin, Alexander (June 2014), *"Automated nuclei clump splitting by combining local concavity orientation and graph partitioning"*. In: IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI).

2013

Antony, Paul MA, **Trefois, Christophe**, Stojanovic, Aleksandar, Baumuratov, Aidos S, and Kozak, Karol (Jan. 2013) , *"Light microscopy applications in systems biology: opportunities and challenges."* In: *Cell Communication and Signaling : CCS* 11.1, p. 24.

2009

Sorniotti, Alessandro, Molva, Refik, Gomez, Laurent, **Trefois, Christophe**, Laube, Annett, and Scaglioso, Piervito (July 2009) , *"Efficient Access Control for Wireless Sensor Data"*. In: *International Journal of Wireless Information Networks* 16.3, pp. 165–174.

2008

Gomez, Laurent, Laube, Annett, Ribiere, Vincent, Sorniotti, Alessandro, **Trefois, Christophe**, Valente, Marco, et al. (July 2008), *"Encryption-based access control for building management"*. In: Proceedings of the 5th Annual International Conference on Mobile and Ubiquitous Systems: Computing, Networking, and Services.

2007

Rumley, Sébastien, Gaumier, Christian, and **Trefois, Christophe** (July 2007), *"Distributed and Component Oriented Tools for Communication Networks Using Web Services". In:* Proceedings of the 6th EUROSIM Congress on Modelling and Simulation.