

# Christophe Trefois

PhD, Dipl.-Ing

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📍 Trefex  
📅 Date of birth: May 1, 1984



*Looking for a challenging position at the bridge between  
Systems Biology and Computer Science*

## 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 Dr 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 Dr 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>

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## Experience

### Vocational

2014

**Postdoctoral researcher**, *University of Luxembourg (LCBS)*, Luxembourg

Leading a change management initiative around reproducible science for the institute (~200 people) and pursuing research on critical transitions in systems in the bioinformatics core group led by Dr Reinhard Schneider.

Main activities include:

- Setting up core virtualization platform for the LCBS;
  - Technologies: Puppet, Foreman, Free-IPA, Icinga 2, Xen.
- Creating data infrastructures for various data types of research labs;
- Contribute to setting up best practises and training to researchers;
- Establish policies on data management.

2010–2014

**PhD candidate**, *University of Luxembourg (LCBS)*, 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:

- Established an automated high content screening platform;
- Set up a microscopic imaging database (OMERO);
- Set 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 & assurance team for various national and international clients.

Activities included:

- IT effectiveness, cost optimisation 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.

Summer 2002

**Web developer**, *Web Technologies*, Luxembourg

Development of a PHP based holiday planner for employees.

Summer 2001

**Web developer**, *Web Technologies*, Luxembourg

Development of an eCommerce platform.

### Teaching

Mar.–Jul. 2007

**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.

2006–2007

**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.

Mar.–Jul. 2006

**Teaching assistant**, *Ecole Polytechnique Fédérale de Lausanne*, Switzerland

Java object oriented programming course – Bachelor in communication systems. Helping students on their assignments and projects and overseeing and correcting exams.

Jul.–Aug. 2000

**Fund support**, *State Street Bank*, Luxembourg

Distribution of mail, sorting of print outs from various funds

Jul.–Aug. 1999

**Fund support**, *State Street Bank*, Luxembourg

Distribution of mail, sorting of print outs from various funds

## Languages

Luxembourgish

**Native**

English

**Proficient**

French

**Proficient**

German

**Proficient**

## Computer skills

Languages

Java, Python, C++, C#, Ruby, YAML, PHP, HTML/CSS, VHDL

Databases

MySQL, PostgreSQL, MaxDB

Web

PHP, JSON, HAML, XML, Twitter Bootstrap, WebSockets

System administration

Puppet, Foreman, FreeIPA, Icinga 2, Xen, Vagrant, Bash

Platforms

Gitlab, Docker, OMERO, ownCloud, Joomla CMS

Tools & OS

LaTeX, Git, SVN, Vim, Eclipse, Visual Studio, R, (Libre–/Microsoft) Office, Windows, Linux (Ubuntu, CentOS), OS X

## Activities

2014

**Vice-President**, *LuxDoc*, Luxembourg

Vice-President of the Luxembourg young researchers association. [www.luxdoc.org](http://www.luxdoc.org)

2012–2014

**President**, *LuxDoc*, Luxembourg

President of the Luxembourg young researchers association. [www.luxdoc.org](http://www.luxdoc.org)

1995–2003

**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](http://www.justmusic.lu)

## Publications

2015

**Trefois, Christophe, Paul MA Antony, Jorge Goncalves, Alexander Skupin, and Rudi Balling**, “Critical transitions in chronic disease: transferring concepts from ecology to systems medicine”. In: *Curr. Opin. Biotechnol.* 34, pp. 48–55.

2014

**Antony, Paul MA, Olga Boyd, Christophe Trefois, Wim Ammerlaan, Marek Ostaszewski, Aidos S Baumuratov, et al.**, “Platelet mitochondrial membrane potential in Parkinson's disease”. In: *Ann. Clin. Transl. Neurol.* 34, pp. 48–55.

2014

**Biryukov, Maria, Paul MA Antony, Abhimanyu Krishna, Patrick May, and Christophe Trefois**, "Evaluation of Cell Line Suitability for Disease Specific Perturbation Experiments". In: *Stud. Classif. Data Anal. Knowl. Organ. Springer*.

2014

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

2014

**Krishna, Abhimanyu, Maria Biryukov, Christophe Trefois, Paul MA Antony, Rene Hussong, Jake Lin, et al.**, "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, Christophe Trefois, Paul MA Antony, and Alexander Skupin**, "Automated nuclei clump splitting by combining local concavity orientation and graph partitioning". In: *IEEE-EMBS Int. Conf. Biomed. Heal. Informatics*.

2013

**Antony, Paul MA, Christophe Trefois, Aleksandar Stojanovic, Aidos Sagatovich Baumuratov, and Karol Kozak**, "Light microscopy applications in systems biology: opportunities and challenges." In: *Cell Commun. Signal.* 11.1, p. 24.

2009

**Sorniotti, Alessandro, Refik Molva, Laurent Gomez, Christophe Trefois, Annett Laube, and Piervito Scaglioso**, "Efficient Access Control for Wireless Sensor Data". In: *Int. J. Wirel. Inf. Networks* 16.3, pp. 165–174.

2008

**Gomez, Laurent, Annett Laube, Vincent Ribiere, Alessandro Sorniotti, Christophe Trefois, Marco Valente, et al.**, "Encryption-based access control for building management". In: *Proc. 5th Annu. Int. Conf. Mob. Ubiquitous Syst. Comput. Networking, Serv.*

2007

**Rumley, Sébastien, Christian Gaumier, and Christophe Trefois**, "Distributed and Component Oriented Tools for Communication Networks Using Web Services". In: *Proc. 6th EUROSIM Congr. Model. Simul.*