

Norwegian University of Science and Technology
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Current Position

Professor at NTNU 2015-...

Professional Background

Head of the Chair Blériot-Fabre (Centrale-Supélec, Safran) Laboratoire de Génie Industriel	2013-2020
Professor at Ecole Centrale & adjunct professor at Ecole Polytechnique	2013-2015
Professor at Ecole Polytechnique & researcher at CNRS	2010-2012
R&D Director, System Engineering Department Dassault Systèmes, Head Quarters, Paris	2008-2010
Founder & President ARBoost Technologies, Marseilles	2000-2008
Senior Researcher CNRS, Université de la Méditerranée, Marseilles	2000-2008
Senior Researcher CNRS, Université Bordeaux I, Bordeaux	1991-2000
Associate Professor Université Bordeaux I, Bordeaux	1989-1991
Assistant Professor Université de la Méditerranée, Marseilles	1988-1989
Navy Officer French Navy, Toulon	1987-1988
Software Engineer PrologIA, Marseilles	1986-1987

Academic Background

Habilitation à Diriger des Recherches (Tenure) in Computer Science Université Bordeaux I, Bordeaux	June 1996
PhD in Computer Science Université de la Méditerranée, Marseilles	January 1989

Research Topics

Reliability engineering and system safety
Model-based systems engineering
Mathematical foundations of models engineering
Algorithms to assess performance of complex systems
Development of modeling environment
Modeling methodologies

Scientific Activities

Publications:

- More than 200 articles in International Journals and Conferences

Supervision:

- Achieved: 16 PhD students (9 since 2010), 3 post-docs (3 since 2010)
- Currently: 1 PhD student (+ 3 co-supervisions)

Animation & Responsibility:

- Management of (over 50) contracts with both institutions and industrial partners
- Member of the boards of International Conferences and Journals (Reliability Engineering and System Safety, Journal of Risk and Reliability...)
- Former member of University Bordeaux 1 Council, and of "Comité National du CNRS".

Personal Data

Nationality: French
Date of Birth: 25/10/1962
Status: Married, 4 children
Languages: French (native), English (fluent), Japanese (basic), Norwegian (basic)

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Scientific Achievements

I made contributions in artificial intelligence, formal methods for software development, reliability and systems engineering. I published over 200 articles in international conferences and journals, with European, American, Chinese, and Japanese co-authors.

My main contributions stand in the field of reliability engineering and system safety:

- Mathematical and algorithmic foundations of fault tree analysis, the most widely used method to assess system reliability.
- Design of AltaRica, a formal object-oriented modeling language dedicated to probabilistic risk and safety analyses.

I have expertise in algorithm design, software development, reliability engineering and system safety, systems engineering and modeling formalisms and methodologies.

Industrial Achievements

Throughout my academic career I had strong partnerships with industry. Moreover,

- I created the startup ARBoost Technologies fall 2001 to develop and distribute risk assessment software. I ran the company until its acquisition by Dassault Systèmes (fall 2007). ARBoost Technologies had clients in France, in the USA and in Japan.
- I joined Dassault Systèmes (from 2008 to 2010) as the head of the R&D department in charge of developing system engineering solutions (with about thirty software engineers reporting to me). I was in charge of defining and implementing solutions, supporting marketing and sales teams, supporting deployment of solutions, hiring collaborators and finally mergers and acquisitions in the domain.
- I created in 2021, CESAMES Systemic Intelligence (Singapore)

Software Development

Alone or in collaboration with my PhD students and post-doc students, I developed several software solutions used in industry:

- Tools for fault trees analysis: Aralia (distributed by Dassault Systèmes) and now XFTA.
- Tools to assess AltaRica models: compiler to fault trees, compiler to Markov chains, stochastic simulator, model checker...

The tools I am developing are now distributed by the non-profit AltaRica Association.

Current Research Activities

I came back to the academy fall 2010 to study foundations of modeling algorithms, languages and methodologies, with a special focus on reliability and systems engineering. I created a research group for that purpose at Ecole Polytechnique. I took the head of the chair Blériot-Fabre (Dependable Embedded System Design) sponsored by SAFRAN spring 2013. I moved to NTNU MTP in August 2015. I am currently focusing on the design of a new version of the AltaRica language (AltaRica 3.0, associated tools and modeling methodologies) as the support of broader research activities.

Some noticeable facts since I came back in academia:

- 11 PhD defenses (Thomas Friedlhuber, Tatiana Prosvirnova, Abraham Cherfi, Pierre-Antoine Brameret, Mélissa Issad, Huixing Meng, Anthony Legendre, Benoît Lebeaupin, Benjamin Aupetit, Yun Zhang, Liu Yang)
- Launch of the Open-AltaRica project in the framework of IRT SystemX
- Development of the AltaRica 3.0 modeling language and associated tools

Teaching

Throughout my career I taught courses on algorithms, programming languages, software engineering, decidability and computational complexity, reliability engineering...

I am currently teaching at NTNU a master level course on model-based systems engineering and safety & reliability engineering, as well as programming for engineers (including machine learning)

I developed also a course on (an Introduction to) complex systems engineering for the 1st year students of Ecole Centrale de Paris (500 students). This course is duplicated at Beihang University and at NTNU.