RÉPUBLIQUE
FRANÇAISE
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# CYBERSECURITY RESEARCHERS AT UBS

Université Bretagne Sud
cyber :

www.univ-ubs.fr

**Yves GROHENS**
Vice President
Innovation

**UBS's ability to energize the territory in which it operates relies primarily on the quality of its research, which is now recognized nationally and internationally in clearly identified areas. Resolutely multidisciplinary, it relies on the richness of its human resources as well as on high-level research units.**

**The implementation of a Research and Innovation policy, geared towards the socioeconomic strengths of its territory, requires UBS to know and master the ecosystems in which its dynamics and scientific expertise are deployed.**

**Thus, as soon as 2013, UBS made the choice to launch the first French cyber defense apprenticeship training program for engineers. The stakes in Research and Innovation are paramount in this field and UBS will continue to develop its skills and offer in cybersecurity for the coming years.**

**Mathias TRANCHANT**
Vice President
Research, Digital
Development and
Public Affairs



# SOMMAIRE

Université Bretagne Sud

ubs :


**University on a truly human scale, enterprising and committed**, UBS has four main priorities: Cyber, Sea and Coast, Materials and Data Science. Thanks to the commitment of its 900 staff (including 500 teachers and research professors), nearly 10,000 students are trained each year on the three campuses of Lorient, Vannes and Pontivy.

**VIDEO**
Research at UBS



**From the outset an agile regional university, UBS made the choice to focus on themes at the forefront of innovation. By devoting to them all its energy UBS produces results that fully meet the expectations both of world of research and business.**

Within this collective effort, cybersecurity research at UBS is based on two principles:

- **Safety right from the start with prevention as a goal - “secure by design”**
  It’s about seeing safety as an intrinsic property of a system and not just as one of its functionalities. This property must be defined and verified from the beginning at the design stage and preserved during execution.
- **Transdisciplinarity**
  Cybersecurity issues are naturally transdisciplinary and cannot be solved - effectively - by treating the different elements separately. Our effort consists in setting up a global project around cybersecurity as a meta-discipline: technical but also legal, ethical, geopolitical, communicational, etc. Experts in computer science and electronics have gradually joined forces with researchers from various fields such as industrial engineering, law, humanities, economics and, in the future, many other disciplines.

We thus consider digital security in an integrated and systemic way, because it combines human factors, installations, connected objects, etc.

# HIGH-LEVEL RESEARCH

## A global approach

Our perspective intermixes computer programs, electronic components, automatons and processes, designed and used by and for people: there is therefore a software - hardware - human triptych on which to lay the foundations for cybersecurity thinking.

## The scientific expertise of five laboratories - university research to attain the best level

The overall dynamic is supported by the federation of several research units with renowned expertise ranging from the study of the behavioral factors to the securing of crypto-processors:

- Lab-STICC - Laboratory of Sciences and Techniques of Communication Information and Knowledge in Lorient
- IRISA - Research Institute in Computer Science and Random Systems in Vannes
- LMBA - Brittany Atlantic Mathematics Laboratory in Vannes
- LEGO - Western France Laboratory of Economics and Management in Vannes
- LABLEX - Law research laboratory in Vannes



## Six main lines of research

UBS's research areas are diverse and complementary:

- Embedded systems and IoT (Internet of Things)
- Industrial cybersecurity
- Socio-technical systems of systems
- Big data and intrusion detection in massive data flows
- Cybersecurity and the individual
- Cyber Defense

## Dedicated teams

Around 30 researchers and doctoral students work in the field of cybersecurity at UBS.

**VIDEO**
Cybersecurity research at UBS
(French version - English subtitles possible with YouTube)

# HIGH-LEVEL RESEARCH

**An innovative University Chair specializing in cybersecurity for major public events**

*« Cybercrime is a well-organized activity with intentions that can be financial, economic, political or vindictive. Major events such as the Olympic Games or the Football World Cup are ideal breeding grounds for such schemes.*

*The objective of our Chair is to protect major events from this type of criminal activity. Our approach is focused on security by design, with a trans-disciplinary philosophy. Indeed, as cybersecurity problems are transdisciplinary, so are our teams".*

*Salah SADOU,*
*Chair holder Cybersecurity*
*for Major Public Events*

## The Chair: an essential link - business-oriented applied research

The research proposed under the Chair is designed to be fertile and easily exploitable. This makes it possible to go beyond current cybersecurity research results and be of immediate benefit to companies and organizations.

## A crucial issue

The massive digitalization of all major national and international public events creates new vulnerabilities, potentially exploitable by hackers, with possible financial losses and physical risks for spectators.

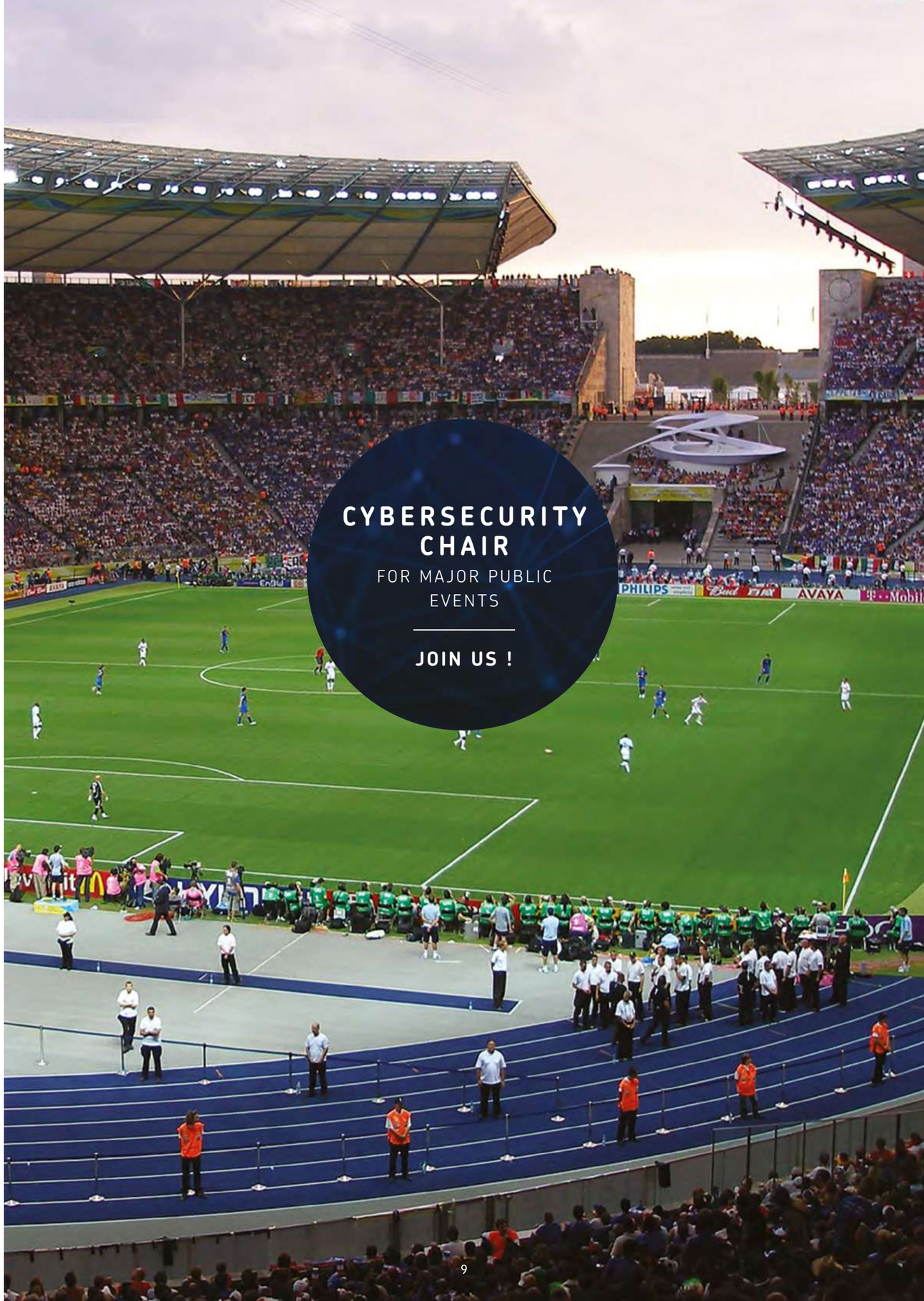
## A little-explored field - an innovative and original approach

Within this theme, the project's main thrust is to consider these events as «systems of social-technical systems» because they combine human factors, installations, connected objects, etc.

GICAT

CYBERGEND





# UMR (JOINT RESEARCH UNIT) 6074
# RESEARCH INSTITUTE IN COMPUTER SCIENCE AND RANDOM SYSTEMS

# IRISA



**More than 850 members** .

**IRISA was created in 1975 and is a joint research unit in computer science, automation, robotics, signal and image processing. Across those themes, IRISA is positioned as the major research laboratory in Brittany with a strong presence on the campuses of Rennes, Vannes and Lannion..**

**IRISA on the UBS site develops activities in several areas of computer science:**

- software architecture
- image synthesis and analysis
- complex images processing
- gestural interaction
- data mining
- mobile computing
- business intelligence
- cybersecurity

**UBS researchers are participating in four of the UMR IRISA teams:**

- ARCHWARE (software architectures)
- CASA (communication and services in networks with intermittent connectivity)
- EXPRESSION (interaction, search, analysis, synthesis of complex multimedia data)
- OBELIX (environment observation by complex imagery)

## SCIENTIFIC FIELDS

Bioinformatics, systems security, new software architectures (Many cores, Cloud computing), virtual reality, artificial intelligence.

## INDUSTRIAL PARTNERSHIPS

IRISA is involved in numerous **industrial partnership** operations in the fields of telecommunications, defense, IT and multimedia, medical instrumentation and transportation
**France**: EADS, Orange, EDF, Nexter System, Renault, ST Microelectronics, Thales, Technicolor, Alcatel...
**International**: TI, IBM, Google, Intel...

## RESEARCH VALORIZATION

Research results are invested in numerous collaborations with industrial partners. Several start-ups have emerged from IRISA research

**LINK**
To the IRISA website

Université Bretagne Sud
cyber :

UMR IRISA

Research Institute in Computer Science and Random Systems

# Jamal EL HACHEM

**Associate Professor**
**Computer Science**

*“Scientific research is one of the most exciting and rewarding of occupations”*

*By Frederick Sanger*

## BIO

Jamal EL HACHEM is an Associate Professor at ENSIBS Vannes, University of Bretagne Sud (since the 1st September 2019). Her research activities focus on investigating Model-Driven solutions for cybersecurity and cyberdefense engineering in a System-of-Systems environment. She obtained her Ph.D. title at University of Pau in December 2017 defending her thesis entitled “A Model Driven Method to Design and Analyze Secure System-of-Systems Architectures. Application to Predict Cascading Attacks in Smart Buildings”. She then worked two years as a temporary research assistant at University of Pau. She works on cybersecurity projects with national and international research laboratories.



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 3

**Awards/Scholarships:**
- Thesis grant from the Landes departmental council, Mont-de-Marsan, 2014-2017, amount: 84 000€;
- Merit-based Award of SIGSOFT CAPS (amount: US $ 350) for participation in ICSE, Italy, 2015;
- Scholarships from the University of Adelaide, Australia (amount: AU $ 5400) and UPPA (amount: 900€) for an international research visit, February - April 2017

**International collaborations:**
- CREST team, University of Adelaide, Australia.
- School of Innovation design and Engineering-Mälardalen University, Sweden.
- Information Systems Engineering Research Group, KU Leuven, Belgium.
- ESL Global Cybersecurity Institute-Rochester Institute of Technology, NY.

## Area(s) of research

Investigation of architecture model-driven engineering approaches to guide modeling and automate cybersecurity analysis of systems.

## Fields of expertise

Modeling, analysis and simulation of cybersecurity
Modeling and assessment of vulnerabilities
Prediction / discovery of security attacks
Model-Directed Engineering (MDE) techniques
Domain Specific Modeling Languages (DSML) definition

## Applicative examples

Security in different types of systems such as Systems-of-Systems, software-intensive systems, multi-agent systems
Security in different domains such as smart buildings, autonomous vehicles, smart electricity grids, Internet of Things, defense, E-health systems, etc.

## Responsibilities

Responsible of gender diversity for the CYBERUS master’s program.
Responsible of the integrated preparatory class (PEI STI2D de l’ENSIBS)
Member of the IRISA Laboratory Council

## Domain

Security by design

## Keywords

Security by Design
Software Vulnerabilities
Systems-of-Systems security
Model Driven Engineering (MDE)

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# Mawloud OMAR

**Full Professor**
**Computer Science**

*“Scientific research stimulates intelligence and anticipation. Let’s seize the opportunity while we still have the choice: it is way better to secure than to defend ourselves”*

## BIO

Mawloud Omar is Full Professor at ENSIBS/UBS and a member of the CASA IRISA team. He obtained his PhD in 2011 and habilitation to direct research in 2022. He was Associate Professor for two years at ESIEE Paris - University Gustave Eiffel. Previously, he was a senior researcher at IRT SystemX and worked for several years as teacher-researcher at the Compiegne University of Technology and at Bejaia University. His research activities are mainly focused on cybersecurity. He is interested in the major challenges related to the protection with high constraints of emerging networks and systems.

Link to full biography



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 10

**Publications/Journals:** 43 - IEEE Transactions on ITS, IEEE Transactions on TVT, JNCA, CS, etc.

**Conferences:** 35 - IEEE ICC, IEEE LCN, IEEE CAMAD, etc.

**International collaborations:**
School of Advanced Technology (Quebec University, Canada), Quebec Outaouias University (Canada), Oregon State University (USA), etc.

## Area(s) of research

Security of very large-scale systems.
Security of highly dynamic systems.
Security of low resource systems.

## Fields of expertise

Trust and key management.
Authentication, biometric authentication and access control.
Privacy and anonymity.
Robustness and intrusion detection.

## Applicative examples

Internet of Things.
Connected vehicles.
Medical applications.

## Responsabilities

Head of the «Information Systems Security» program at ENSIBS (2022-*).
Several responsibilities in the past (department director, research team leader, etc.).

## Domain

Security of systems with high constraints

## Keywords

Security
Safety
Reliability

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# Salah SADOU

**Full Professor**
**Computer Science**

*“Transdisciplinarity enriches science, but also the scientist”*

## BIO

Salah Sadou is the holder of the large public events cybersecurity chair and responsible for the Computer Science and Cybersecurity specialization at the National Engineering School of Southern Brittany (ENSIBS). He is also in charge of a cybersecurity research team at IRISA.

He obtained a PhD degree in Junuary 1992 at Ecole Centrale de Lyon, France. He has about 30 years of experience in research and education in software engineering science. His past research interests were centered on languages, processes and tools for designing and engineering systems where the evolution acts as a first-class entity. He was also involved in research concerning architectural description languages with non-functional properties as first class entities, software restructuring (from object-oriented to component-oriented), component-based description languages and software quality. His current research interests focus mainly on the “Secure by design” approach for System of Systems and Socio-technical System construction.

Link to full biography



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 20

**Post-doctoral fellows:** 3

**Journals:** 20 - JSS, Future Gener. Comput. Syst, Automated Soft. Eng., etc.

**Conferences:** 70 - WICSA, ECSA, ASE, CBSE, ICECCS, Middleware, etc.

**Book(s):** Software Evolution, Hermes-Lavoisier

**Award(s):** ACM SIGSOFT Distinguished Paper Award (2011), several best papers.

**International collaborations:** Université of Montreal (Canada), UQAM (Canada), Université Libre of Bruxelles (Belgique), Luxembourg University (Luxembourg), Qatar University (Qatar), Politecnico di Milano (Italie), etc.

## Area(s) of research

Systems of Systems Security

## Fields of expertise

Code vulnerability identification
Design vulnerability identification
Estimating human vulnerability in a system
Assessment of an element’s vulnerability impact on the system
Proposing secure software development best practices

## Applicative examples

Organization of large secure events.
Identification and correction of flaws in existing software systems.

## Responsibilities

Head of Software Cybersecurity Department of ENSIBS
Scientific Header of the University Chair Cybersecurity of major public events
Co-header of the RIMEL working group from the GDR GPL of CNRS (2006-2014)
Header of the SE research team (Valoria, UBS,2004-2012)

## Domain

Software security

## Keywords

Secure by Design
Software Vulnerabilities
Systems of Socio-Technical Systems Security
Security-Oriented Modeling
Security-Oriented Specification

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# Nicolas BELLOIR

**Associate Professor**
**Computer Science**

*“It’s important to go beyond the limits of our discipline to be enriched by other fields”*

## BIO

After a master’s degree at Paul Sabatier University (Toulouse) and a stint in the aeronautics industry, Nicolas Belloir defended his thesis on software composition at University de Pau et des Pays de l’Adour in 2004, where he is appointed as Associate Professor and focuses on engineering languages for complex systems. He joins University Bretagne Sud in 2016 and is seconded to the French Military Academy of Saint-Cyr Coëtquidan. The stakes for the creation of a true cyber force are considerable and his research, often conducted jointly for the civilian and military worlds, highlights vulnerabilities detection and since recently takes into account influence warfare. Through a multidisciplinary approach, the robustness of systems is designed to counter vulnerabilities which can be physical, software or human. Beyond software aspects, he is particularly interested in social engineering and socio-technical systems of systems.

Link to full biography



**75%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 7

**Publications:** 5 - Systems Engineering, JSS, etc.

**Conferences:** 40 - Conceptual Modelly, Trustcom, SoSE.

**International collaborations:** Polytechnic University of Valencia (Spain).

## Area(s) of research

Systems security engineering, human factors in security design processes, computerized influence control.

## Fields of expertise

Vulnerability detection during the design phases.
Improved communication between software (or system) engineer and safety engineer.
Modeling Language.

## Applicative examples

Vulnerability analysis software for socio-technical systems.
Definition of a tool-based threat analysis method.
Definition of a conceptual model of Fake News.

## Responsabilities

Holder of the Saint-Cyr Thales «Cyberdefense-Cybersecurity» Chair.
Deputy Director of the Cyberdefense and non-kinetic areas specialized master’s degree of the French Military Academy.
Various projects in dual civil and military research (DGA - French Procurement Agency / Naval Group) on software and socio-technical systems vulnerabilities detection.

## Domain

Secure by design
Computerized influence control

## Keywords

Design
Engineering
Systems of systems security
System and human vulnerability analysis
Fake News

## Contact

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Research Institute in Computer Science and Random Systems

# Isabelle BORNE

**Full Professor**
**Computer Science**

*“Computer security is not just a matter for specialists and without women there would be no Internet - let us remember that the first «bug» was discovered thanks to Grace Hopper!”*

## BIO

After obtaining her PhD thesis at Pierre-et-Marie Curie University (Paris-6), Isabelle Borne spent two years post-doc in Montreal at the University of Montreal and at McGill University in Canada. Then she spent 10 years at René Descartes University (Paris 5) and then 7 years at Ecole des Mines de Nantes. In 1994 she was invited to the Educational Technology Institute at the Open University in Milton Keynes (UK) and at Manchester where she worked on object-oriented programming environments. Finally she joined the University of Bretagne Sud in 2001 where she is currently interested in the security of systems of systems, and more specifically in the use of security patterns and metrics to guarantee a level of security of software architectures of systems of systems.

Link to full biography



**50%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 7

**Publications:** 11 - JSS, Future Generation Computer, etc.

**Conferences:** 46 - CSMR, ECSA, SoSE, ISPEC, etc.

**International collaborations:** University of Montreal (Canada), Universidad de los Andes (Colombia), etc.

## Area(s) of research

Security of systems of systems architectures.

## Fields of expertise

Modeling and meta-modeling of systems of systems architecture.
Refactoring with security patterns.
Software security metrics.

## Applicative examples

Simulation of an emergency system-of-systems .
Assessment of the security level of a software architecture.
Secure smart building architecture.

## Responsibilities

MathSTIC Doctoral School Deputy Director.
UBS management team member.
Co-responsible of the MDE action of GDR GPL &ASR (2012-2015).
Security WG Co-leader of the GDR GPL software development.

## Domain

Software engineering

## Keywords

Model based engineering
Secure software architecture
Secure by design
Security patterns

## Contact

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Research Institute in Computer Science and Random Systems

# Pierre-François MARTEAU

**Full Professor**
**Computer Science**

*“Abnormality is the anomaly of normalcy unless it’s the other way round. Identifying the anomaly is often the preamble to disruptive discoveries.”*

## BIO

After obtaining an engineering degree in computer science at the École Nationale Supérieure d’Electronique et d’Informatique de Bordeaux (ENSEIRB-MATMECA), then a PhD at the Institut national polytechnique de Grenoble in 1988, Pierre-François Marteau held a post-doctoral position at the University of Geneva, then at the INLS of the University of California (San Diego). Following a stint at the Institut des Hautes Etudes Scientifiques, he worked as a consultant at Bertin Technologies, before joining University Bretagne Sud in 1999. His work focuses on algorithmic approaches of artificial intelligence for pattern recognition in temporal and sequential data. He develops applications in the fields of information flow processing, particularly in a context of computer security and the processing of data from multi-modal sensors and text mining collected on the web and social networks.

Link to full biography



**50%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Area(s) of research

Anomaly and intrusion detection.
Data processing in flow and time series (classification, regression, clustering).
Motion analysis and gesture recognition.
Textual data mining.

## Fields of expertise

Algorithms and complexity.
Signal processing and pattern recognition.
Natural language processing.

## Applicative examples

Several algorithms for intrusion detection and algorithmic efficiency: DiFF-RF (network traffic monitoring), STree4CS (event sequencing for attack detection), PSS-Phase Shape Separation (handwritten signature authentication by analyzing time and shape patterns).

## Domain

Computer Science, discrete mathematics

## Keywords

Artificial Intelligence
Statistical learning
Data Mining
Pattern recognition
Anomaly detection
Time series analysis
Text data processing

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Université Bretagne Sud

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UMR IRISA

Research Institute in Computer Science and Random Systems

# Nicolas COURTY

**Full Professor**
**Computer Science**

*"You can fool once a thousand AI algorithms, but not a thousand times an AI algorithm"*

## BIO

After a PhD on active vision (INSA Rennes, 2002), Nicolas Courty specialized in crowd simulation during his post-doctorate in Brazil. He joined University Bretagne Sud in 2004 where he continued with the analysis of crowd simulation models and sign language. He was invited to Beijing for eight months in 2012, then two months at EPFL Lausanne in 2014. Since 2012 he's been developing methodologies for machine learning and remote sensing. His research activities within the Obelix team (IRISA) that he leads since 2020, focus on statistical learning, optimal transportation, and deep learning. In cybersecurity issues, he mainly focuses on the security and vulnerabilities of AI algorithms. An article reviewer for several AI journals and conferences, he also holds a chair in Artificial Intelligence at the National Research Agency, with a project on optimal transport and remote sensing.

Link to full biography



**25%** of the researcher's activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☒

## Core data

**PhD students:** 16

**Post-PhD students:** 3

**Publications:** 38 - IEEE PAMI, IEEE TGRS, Machine Learning, etc.

**Conferences:** 63 - NeurIPS, ICML, ICLR, AISTATS, etc.

**Book(s):** 4 chapitres - Deep learning for earth science, Wiley 2020.

**Award(s):** U.V. Helava Award 2015 ; 4 Best Paper Awards (international conferences).

**Patent(s):** 1 - Method for counting individuals in a crowd, 2014 (Thales / CNRS)

**International collaborations:** Kyoto University (Japan), Wageningen University (NL), University of the Balearic Islands (ES). Invited to Beijing (2012 - funded by the Chinese Academy of Sciences) then to EPFL Lausanne (Switzerland - 2014).

## Area(s) of research

AI Theory.
Remote Sensing.
Computer vision.

## Fields of expertise

Statistical learning.
Deep learning.

## Applicative examples

Satellite images semantic segmentation in a context of jammed labels.
Security of AI Algorithms in Remote Sensing.
Graphs structured data learning.

## Responsabilities

- Head of the Obelix team (since 2020).
- Member of ELLIS, European laboratory for the promotion of Artificial Intelligence (since 2020).
- Head of the ANR OATMIL project - links between optimal transport theory and machine learning.
- Head of the Labex COMINLABS Dynalearn project - links between deep learning and physical models.
- Leader of the UBS Data Sciences Division.
- UBS Data Sciences Engineering Masters' Director of Studies.
- IA international expertise for ANR (National Research Agency).

## Domain

Artificial intelligence

## Keywords

Optimal transport
Neural networks
Core machines

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# UMR 6285

# SCIENCES AND TECHNOLOGY LABORATORY OF INFORMATION, COMMUNICATION AND KNOWLEDGE

# LAB-STICC



**560 members**

**The Lab-STICC's motto «From sensors to knowledge: communicating and deciding» initially underlined the intention to give «meaning» to the «sign», in terms of interpretations and increased value with respect to treatments based on a signal in all its forms. Today, this motto is even more reinforced by the importance of data, which is becoming the vector of technological and scientific innovation, undeniably boosted by the major advances in science in the field of cognition and artificial intelligence.**

The Lab-STICC, with its double affiliation to the INS2I and INSIS institutes of the CNRS, is a research unit historically recognized in Brittany and in France in the field of ICTS. It has a proven capacity to cover a broad scientific spectrum around digital sciences, and in particular with this ability to address various disciplinary fields (Information Theory, Waves & Materials, Embedded Electronics and Computing, Data Sciences, Communication and Signal Detection, Human-Machine Interfaces,...) following multiple themes/application sectors: maritime environment, communicating objects, defense, space, health, security, robotics...

560 researchers on average (permanent and non-permanent staff) carry the activities of the Lab-STICC by covering strong scientific themes, well targeted. Innovation remains at the heart of the concerns of our researchers, and the large-scale cross-disciplinary actions launched in the context of the present four-year period (around cybersecurity, AI, UAVs and embedded systems, robotics, virtual or augmented reality, etc.) have led to the consolidation of the scientific departments on the one hand, but also to the emergence of new structuring tools (research chairs, contribution to the construction of the International Research Lab (IRL) Crossing, technological platforms, start-ups, EuR).

**LINK**
To the Lab-STICC website

Université Bretagne Sud
cyber :

Lab-STICC

Sciences and Technology
Laboratory of Information,
Communication and Knowledge

# Guy GOGNIAT

**Full Professor**
**Embedded systems**

*"Collaborative research is a good to be cultivated with passion"*

## BIO

After obtaining his PhD in 1997 at University of Nice Sophia-Antipolis, Guy Gogniat joined the University of Brittany South in 1998. During 2004 and 2005, he was invited to the University of Massachusetts (USA), where he worked on the security of reconfigurable architectures. Since 2003, his research activities concern the security of embedded systems against software and hardware attacks. His research is supported by national and European funding programs.

Link to full biography



**100%** of the researcher's activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 31

**Post-PhD students:** 5

**Publications:** 40 - IEEE TVLSI, IEEE TC, ACM TODAES, ACM TECS, etc.

**Conferences:** 130 - DATE, FPL, FCCM, FPGA, FPT, ReCoSoC, DSD, etc.

**Book(s):** Security Trends for FPGAs - Springer.

**Award(s):** Best Paper Award (ReCoSoC 2015), IFIP SEC 2020, CYBER2020).

**Patent(s):** Reconfiguration method for an electronic circuit set of components (2008).

**International collaborations:** Ruhr-Universität Bochum (Allemagne), University of Massachusetts (USA), Université Libre de Bruxelles (Belgique), Université Technique de Munich (Allemagne), Information Technology University (Pakistan), Politecnico di Milano (Italie), etc.

## Area(s) of research

Embedded systems security

## Fields of expertise

Protection of embedded system architectures
Protection of processor architectures
Intrusion detection systems
Development of crypto-processors

## Applicative examples

Protection of health data and multimedia applications.
Operating systems protection.

## Responsabilities

- Vice-Dean of the Faculty of Science and Engineering (2022 -*)
- UBS Cyber Ecosystem Project Manager (2020 -*)
- Co-director of the Science and Technology Department of the Faculty of Science and Engineering (2020 - 2023)
- Vice-President Research UBS (2016-2020)
- Assessment Committee NRA Global Security and Cybersecurity (2017-2020)
- Lab-STICC Deputy Director (2010-2016)
- Co-Leader of the Math-STIC disciplinary group of the SICMA doctoral school (2010-2016)
- Institute of Information Sciences and their Interactions Scientific Council CNRS INS2I (2015-2018)
- Co-Leader theme C research group ISIS (2009-2015)
- Co-responsible for the digital security theme of the research group SoC-SiP (2009-2013)

## Domain

Hardware security

## Keywords

Cryptography
Cryptoprocessor
Hardware and software attacks
FPGA
NoC
Code Obfuscation

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Université Bretagne Sud
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Lab-STICC

Sciences and Technology
Laboratory of Information,
Communication and Knowledge

# Vianney LAPÔTRE

**Associate Professor**
**Embedded systems**

*“Today’s research is the foundation for tomorrow’s technologies”*

## BIO

After obtaining his Ph.D in 2013 on reconfigurable multi-core architectures applied to telecom issues, Vianney Lapôtre returns to UBS in 2014, where he currently works on the security of embedded systems. Previously, as a Post-doctoral fellow at the LIRMN Lab (Montpellier) he participated in the European Mont-Blanc project where the technologies derived from embedded systems were studied to design tomorrow’s energy efficient supercomputers. Since 2017, his research focuses on embedded processors security. Offering secure processors is a priority for him so that the greatest number benefit from trustworthy technologies.

Link to full biography



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 9

**Post-PhD students:** 2

**Publications:** 11 - IEEE TVLSI, IEEE TC, ACM TECS, etc.

**Conferences:** 37 - FPL, FPT, ISCAS, ASP-DAC, ISVLSI, etc.

**International collaborations:** Ruhr-Universität Bochum (Allemagne), Information Technology University (Pakistan).

## Area(s) of research

Embedded systems security

## Fields of expertise

Protection of embedded processor architectures
Protection of embedded system architectures

## Applicative examples

Protection of connected objects
Protection of sensitive data

## Collaborative projects

CominLabs SCRATCHS (Labex CominLabs 2021-2024 project) with IRISA, INRIA Labs.
HardBlare (CominLabs 2015-2019 project) with IRISA, INRIA & IETR Rennes Labs.
TSUNAMY (NRA 2013-2017 project) with the Hubert Curien (St Etienne), LIP6 (Paris) & CEA Saclay Labs.

## Domain

Hardware security

## Keywords

Hardware and software attacks
On-board processors
FPGA

## Contact

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Université Bretagne Sud
cyber :

Lab-STICC

Sciences and Technology
Laboratory of Information,
Communication and Knowledge

# Philippe TANGUY

**Associate Professor**
**Embedded systems**

*"The communicating objects security must be designed with consumption and durability in mind"*

## BIO

Beginning with his PhD (INSA Rennes 2012), Philippe Tanguy has always been interested in embedded systems communications. As a postdoctoral fellow at Telecom Bretagne within a multidisciplinary team (IHSEV, Lab-STICC, IMT Atlantique) he studied IoT communication protocols, companion robots, health and well-being services (European project FP7 PRECIOUS). He was a teacher-researcher for two years at INSA Rennes before joining University Bretagne Sud in 2018. His work deals jointly with digital communication and hardware architecture. By designing objects that use low resources, his aim is to connect cities, industries and transport to make them smarter and more energy efficient. This is principally achieved by securing those objects and partly through communications to be more robust against network attacks.

Link to full biography



**100%** of the researcher's activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 1

**Publications:** 5 - JCM, JECE, JISYS, KI - Künstliche Intelligenz, EAI endorsed transactions on pervasive health and technology.

**Conferences:** 14 - WSPLC, ATC, ITST, EAI, etc.

**Book(s):** 2 chapitres - Vehicular Technologies (2011), CMOS Emerging Technologies (2012).

**Award(s):** Best Paper Award (ICSNC 2014).

## Area(s) of research

Embedded systems security.

## Fields of expertise

Protection of communicating embedded system architectures
Software Defined Radio.

## Applicative examples

Intelligent city design, intelligent transport, industry of the future, health.

## Collaborative projects

- Head of the Cyber Security of Embedded Systems course of the Complex Systems Engineering Master (2020 - )
- POLYPHEME (CNRS contract 2017-2018) for INEO Defense
- PRECIOUS FP7 n ° 611366 (European project) - Design of digital health and well-being services
- CIFAER (ANR 2008-2012 project) - Flexible intra-vehicle communication and reconfigurable embedded architectures
- TRUSTGW (ANR Project 21-CE39-0005) Protection of IoT gateways against software and communication threats

## Domain

Hardware Security

## Keywords

Hardware and software attacks
Network attacks
FGPA
IDS / IPS

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# CAMILLE MONIÈRE

**Associate Professor**
**Electronics and embedded informatics**

*“The present climatic and social challenges require us to think about the security, the efficiency, and the sustainability of digital systems conjointly”*

## BIO

Camille Monière’s thesis work focused on the development of energy- and resource-efficient software and hardware implementations of communicating systems (ANR QCSP project). During his research at the *Lab-STICC UMR 6285* and the university *Bretagne Sud*, he observed that security and efficiency aspects of system implementations are often explored independently. Yet, these two aspects exert a mutual influence: the enhancement of security functions can result in an increase in power consumption, while the enhancement of efficiency can be accompanied by an increase in the attack surface. Now that he is an associate professor at university *Bretagne Sud*, he strives to reconcile the two approaches by considering them from the design stage of systems-on-chips and even integrating them into communication protocols.



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**Publications:** 1 - Elsevier JSA.

**Conferences:** 4 - DASIP, SiPS, EuCNC, COMPAS.

**Reward:** Best Paper Award (DASIP 2022).

## Area(s) of research

Security and energetic efficiency of embedded systems.

## Fields of expertise

Efficient hardware and software implementations.
Software-defined radio.

## Applicative examples

Industry of the futur, secure-by-design, econimic and ecologic embedded communication systems, healthcare.

## Collaborative projects

- Director of Studies of 1st and 2nd year of the SNIO (« *Sciences Numériques, Internet et Objets connectés* », i.e. digital sciences, internet and connected devices) mention of the license « communicating systems sciences » (2023 - *).
- QCSP (ANR project 2019 - 2023) - Development, design and efficient implementation of a new-generation, low-power, long-range, reliable communication protocol for the Internet of Things and sensor networks.

## Domain

Hardware security and efficiency

## Keywords

High-level synthesis
Hardware and software implementations
Energetic efficiency
Algorithme-architecture adequacy

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# Laurent GUILLET

**Associate Professor**
**Health Social Psychology**

*"To be effective technology, technological innovation and their uses must be accompanied by the study of human factors"*

## BIO

Laurent Guillet arrived at the University Bretagne Sud in 2004 and his main interest deals with human factors. His first work focused on the cognitive processes involved in the evaluation of stress with the completion of his PhD in 2002 (University of Nantes). When the cybersecurity education program started at UBS, his research immediately joined the issues encountered, specifically the study of human behavior. The ENSIBS Cyber Range (technical platform for the simulation of cyber-attacks) enables him to study how individuals react and interact in crisis situations: stress management, mental load, cooperation phenomena, leadership, shared mental models to gain efficiency... This is done using various activity measurement devices (eye-tracking, heart rate monitors, brain activity measurement, communications analyses). Vulnerability issues guide his research on cyber risk perception and prevention. The goal is to make computer and digital tool users truly actors of their own prevention by adopting safer behaviors.

Link to full biography



**35%** of the researcher's activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☒

## Core data

**PhD students:** 2

**Post-PhD students:** 1

**Publications:** 14 - Stress & Health, Risk Analysis, CTW, PUR.

**Conferences:** 20 - HFES, SFP, ADRIPS, AIPTLF, AFPSA, SELF, ARPEGE.

**Book(s):** Stress, 2012.

**International collaborations:** Washington (USA).

## Area(s) of research

Behavior modeling

## Fields of expertise

Crisis management
Risk perception
Team Management
Team building
Acceptability

## Applicative examples

Crisis management within a Security Operational Center.
Cybersecurity risk prevention and perception

## Responsabilities

Head of Department BUT QLIO (University Bachelor of Technology - Quality, Industrial Logistics and Organization) - IUT (University Techological Institute) Lorient

## Domain

Human Factors /
Health psychology

## Keywords

Crisis management
Stress
Mental load
Social Support
Management
Adaptability
Prevention
and Risk Perception

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# Salwa ALEM

**Lecturer and researcher in industrial cybersecurity**

*“Science should no longer be exclusive, but an integral part of culture”*

## BIO

Her studies as a telecom engineer led to a PhD conducted in 2018 at UBS on intrusion detection for Industry of the Future. Salwa Alem followed this up with a post-doc on anomaly detection in the agri-food industry, before being recruited as a teacher-researcher at ENSIBS, where she shares her knowledge of industrial security, software, networks and virtualization. In 2023, she joined Lab-STICC’s IRIS team, working on intrusion and industrial anomaly detection. Within the Cyber Food project, she uses these detections to reduce food waste, nutritional degradation and energy costs. She is currently supervising a post-doc funded by the AUB (Association Universitaire de Bretagne) on the same theme. Salwa Alem also works in partnership with INERIS, integrating human factors and cybersecurity.

Link to full biography



**30%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Focus:**
**Research** [X]
Application field [X]

## Core data

**Post-PhD students:** 1

**Publications:** 5, Cybersécurité industrielle

**Conferences:** AICCSA Abu D’habi 2019, CRISIS 2020 Paris, IFAC 2023 Japon, etc.

**International collaborations:** University of Antananarivo (Madagascar), ENSA of Kenitra (Morocco).

## Area(s) of research

Intrusion detection.
Security and safety of cyber-physical systems.
Human factor and cybersecurity.

## Fields of expertise

Cyber physical systems (CPS).
Industrial cybersecurity.
Neural networks.

## Applicative examples

Conventional industry.
Industry 4.0.
Agri-food sector.
Standard information systems.

## Responsabilities

CyberFood - Detecting anomalies and intrusions in the agri-food industry (Lab-STICC IRIS team).
Cybersecurity and the human factor: technical, operational and organizational analysis of practices and human behavior that may be a source of vulnerabilities in the industry.

## Domain

Intrusion detection
and industrial cybersecurity

## Keywords

Industry 4.0
Intrusion detection systems (IDS)
Artificial intelligence
Neural networks

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# Pascal BERRUET

**Full Professor**
**Automation and industrial engineering**

*“Innovation requires a global approach at the interfaces between fields of research”*

## BIO

Pascal Berruet joined University Bretagne Sud in 1999 after his PhD on production systems reconfiguration obtained in 1998 at Ecole Centrale Lille. While his research has remained essentially the same (modeling, discrete-event systems), he’s bringing it towards application areas around the issues and limits of personal assistance (disability, home automation, etc.). More generally, in a multidisciplinary approach, he integrates the problems of managing complex socio-technical systems. By combining human factors and automation, he’s invested in man-machine cooperation going beyond breakdowns and attacks’ robustness guarantee. He also proposes to make the industrial world aware to cyber-attacks and to the contribution of reconfigurable systems.



**25%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☒

## Core data

**PhD students:** 18

**Post-doctoral fellows:** 2

**Publications:** 16 - JIM, H&T, SIMULATION, Computers in Industry, Applied Ergonomics, STH, etc.

**Conferences:** 90 - MOSIM, IEEE SMC, IFAC, IMACS, HMS, MSR, etc.

**Book(s):** 5 - “Advanced Manufacturing”, Springer 2019 ; “Techniques de l’ingénieur”, 2007, 2010 ; Productique Traité IC2, 2002

**Award(s):** FRATH 2013 best thesis award

**Patent(s) :** 1 - Software repository: Consumer app (2016)

## Area(s) of research

Management of complex socio-technical systems.
Design of safe and reconfigurable socio-technical systems.
Optimization of human-machine cooperation.

## Fields of expertise

Reconfigurable discrete-event systems.
System supervision and control monitoring.
Generation of the control command.
Modeling / Simulation.

## Applicative examples

Sensor/actuator level safety in industrial systems.

## Responsabilities

- Head of Department IUT QLIO (2018-2020).
- Vice-President Socio-Economic and Industrial Relations. University Bretagne Sud (2012-2016).
- Responsible for the work-study master’s degree production management (1999-2008).
- Pilot and coordinator of the SOLENN project -12 partners 900 experimenters around energy control and security (2014-2018).
- ASIM (e-health project) assistant for health and management of domotised habitats (2012-2014).
- Various CIFRE collaborations around design of control and supervision interfaces based on business models.

## Domain

Complex systems safety

## Keywords

Detection and reaction to attacks
Joint simulation
Socio-technical systems

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# Christine CHAUVIN

**Full Professor**
**Cognitive ergonomics**

*“The rapid transitions facing modern societies are generating new challenges that can only be tackled through systemic and interdisciplinary approaches”*

## BIO

Christine Chauvin holds a PhD in cognitive ergonomics (obtained in 1996 from René Descartes University) and was recruited at UBS as Associate Professor in 1997. Habilitated to supervise research in 2008, she is Full Professor since 2010. Her research focuses on decision-making in dynamic situations, risk management and human-machine cooperation in highly automated systems. It is mainly applied to the transport sector (ship driving, autonomous vehicles, aviation) and crisis management. They aim to improve performance, efficiency and resilience of complex socio-technical systems. They are part of a more general reflection on the impact of digital and industrial transitions on human activities and organizations, and within an interdisciplinary framework at the border between human and social sciences and engineering sciences.

Link to full biography



**25%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [ ]

## Core data

**PhD students:** 15

**Post-PhD students:** 2

**Publications:** 37

**Conferences:** 75

**International collaborations:** Memorial University of Newfoundland (Canada), Sherbrooke University (Canada), University of South Australia (UniSA), Feuerwehr Ludwigshaven (Germany).

## Area(s) of research

Sociotechnical systems reliability

## Fields of expertise

Modeling cognitive activities in dynamic and complex situations.
Identification of operators’ cognitive strategies.
Identification of cognitive control modes.
Measuring operator and crew efficiency.
Design and evaluation of Human-Machine Interfaces.
Accident analysis.

## Applicative examples

Measuring operators’ efficiency in a cyberattack situation.
Analysis of fire crews’ efficiency in emergency situations.
Interface design using Augmented Reality for the supervision of autonomous vehicles
«Ecological» interface design for submarine piloting.
Analysis of Human and Organizational Factors in the Occurrence of Marine Accidents.

## Responsabilities

- Vice President International Relations at UBS since 2016.
- Responsible for the FHOOX team (Human and Organizational Factors, Automation and Complex Systems) of the Lab-STICC laboratory from its creation until 2020.
- President of the national association ARPEGE (Association for Research in Ergonomic Psychology and Ergonomics) from 2012 to 2018.
- Head of the Thematic Group «Decision-making and risk management in dynamic situations» within the “Psycho-Ergo» GDR from 2007 to 2011.

## Domain

Human and Organizational Factors

## Keywords

Decision-making in dynamic situations
Mental representations
Risk management
Human-machine cooperation

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# Philippe COUSSY

**Full Professor**
**Embedded systems**

*“Research: a fantastic space of freedom”*

## BIO

A graduate of Paris 6 - Pierre and Marie Curie University, Philippe Coussy obtained his PhD on high-level synthesis at University Bretagne Sud in 2003. He appointed there as Associate Professor in 2004, obtained the ability to supervise research in 2011 and became full professor in 2014. His research activities focus on hardware architectures and associated software tools: high-level synthesis of non-programmable hardware accelerators, automatic generation of conflict-free memory interleavers, coarse-grained reconfigurable architectures and associated compilation tools, silicon neural network architectures, hardware and software design. Since 2015 he extended his field of research to the security of embedded systems. His research is supported by regional, national and international funding.

Link to full biography



**25%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 21

**Post-doctoral fellows:** 6

**Publications:** 15 - IEEE (TCAD, D&T, TNNLS, TSP), ACM (JETCS, TECS), etc.

**Conferences:** 70 - DATE, ASP-DAC, ICCAD, FPL, ISCAS, ICASSP, SIPS, etc.

**Book(s):** 2 - “High-Level Synthesis: From Algorithm to Digital Circuit”, 2008 Springer ; “Advanced hardware design for error correcting codes”, 2008 Springer. Associate editor IEEE Transactions on Computer Aided Design of Integrated Circuits and Systems (TCAD), IEEE Signal Processing Letters (SPL)

**Award(s):** IEEE Senior Member, Member of the HiPEAC Network of Excellence

**Patent(s):** 6 - Interleaving method, neural network architecture method, fault tolerance device, active cache…

**International collaborations:** University of Bologna (Italy), ETH Zurich (Switzerland), Polytechnic University of Milan (Italy), University of California in Los Angeles (USA), University of California in San Diego (USA), McGill University (Canada), Brown University (USA), University of Palakkad (India)...

## Area(s) of research

Hardware architectures and associated software tools

## Fields of expertise

High-level synthesis - Electronic Design Automation (EDA)

## Applicative examples

GAUT open-source high-level synthesis tool

## Responsabilités

- Deputy director Lab-STICC (since June 2020)
- Deputy Director Phd School MathSTIC (2017-2020)
- Director of the STIC (which evolved to Complex Systems Engineering) Master’s Degree (2015-2020)
- Head of the Communications, Architectures, Circuits and Systems (CACS) division of Lab-STICC (2016-2020)
- Member of the scientific committee of the LATERAL Thales / Lab-STICC joint laboratory (2018-)
- Elected member of the International Technical Committee IEEE Signal Processing Society, Design and Implementation of Signal Processing Systems (DISPS) (2011 to 2013, 2015 to 2021)
- Member of the evaluation committee National Research Agency (NRA) INS (2012-2014), NRA Micro-Nano CES 24 (2015-2017)
- Co-Leader of the Math-STIC disciplinary group of the SICMA PhD School (2016-2017)
- In charge of the theme « Embedded Software and Hardware Architectures « of the Research Group Soc-SIP (2011-2016)

## Domain

Electronic components design method

## Keywords

High-level synthesis
Reconfigurable coarse grain architectures and associated tools
Automatic generation of conflict-free memory interleavers
Silicon neural network architectures

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# Philippe RAUFFET

**Associate professor**
**Automation / Human-Machine Systems**

*“To face dynamic and critical situations, we must think of technologies and new systems, no longer as simple tools, but as interdependent teammates with human operators”*

## BIO

After obtaining a degree in Industrial Engineering in 2007 and a PhD in Computer Engineering from Ecole Centrale Nantes in 2010, Philippe Rauffet joined University of Brittany South, where he has been Associate professor since 2012 and authorized to direct research (HDR) since 2021.

He spent a researcher mobility year in Australia (2021-2022) with a CNRS delegation to work on human-machine cooperation topics.

His work, combining automation, signal analysis and cognitive sciences, is part of the Human-Autonomy Teaming (HAT) paradigm and aims to improve the functioning of hybrid teams, in which human operators cooperate with autonomous artificial agents. His research is carried out in the framework of national projects and international industrial collaborations, mainly applied to the fields of Industry 4.0 and transportation.

Since 2017, he has investigated the cyber defence field to analyze human-system cooperation processes and operators’ adaptation mechanisms when facing critical situations and stress.

Link to full biography



## Core data

**20%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☒

**PhD students:** 6

**Post-PhD students:** 5

**Publications:** 14 - Cognition Technology and Work, Computers In Industry, Frontiers in Psychology, Le Travail Humain, International Journal of Technology Management, etc.

**Conferences:** 44 - IFAC Human-Machine Systems, IEEE on Systems, Man and Cybernetics, H-Workload, HFES European Chapter, IFAC World Congress.

**Book(s):** 6 chapters - Human Mental Workload: Models and Applications, Springer, 2019, CCIS series, Springer, 2022.

**Award(s):** Best papers at the 4th International CHIRA Conference (2020) and at the 13th International IFAC HMS Conference (2016).

**International collaborations:** University of Adelaide (Australia), University of South Australia (Australia), IRL CNRS CROSSING (Australia), Ariel University (Israel), Stellenbosch University (South Africa).

## Area(s) of research

Operator’s cognitive states classification and monitoring.
Modeling and design adaptation mechanisms for human-machine systems at distribution and dialogue working level.

## Fields of expertise

Modeling and evaluation adaptation mechanisms at individual (cognitive control modes). and collective levels (dynamic allocation of functions, team management processes).
Neurophysiological signals analysis and classification (fNIRS, ECG, Eyetracking).
Design of ecological and transparent interfaces.

## Applicative examples

High level mental loads among UAV operators and Rafale fighter pilots.
Supervision interfaces Dynamic reconfiguration in order to reduce mental load or to improve confidence in maritime predictive maintenance systems.

## Responsabilities

Head of the FHOOX team (Human and Organizational Factors, Automatics and Complex Systems) (2020 - *).
Head of the SHM (Human-Machine Systems) cluster of the Lab-STICC laboratory (2022- *).
Head of the LOGIQ Vocational Bachelor (2015 -*).
Numerous collaborations in the Industry 4.0 (ANR HUMANISM, ANR RODIC, ADEME SEANATIC) and transportation fields (ANR TAPAS, collaboration with Renault, Airbus, Dassault Aviation and Thales).
.

## Domain

Human-Autonomy Teaming / Human-Computer Systems

## Keywords

Socio-technical systems modeling
Neurophysiological data analysis and processing
Automation and adaptive human-machine dialogue

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LMBA
Laboratoire de Mathématiques de Bretagne Atlantique
UMR6205 - CNRS/UBO/UBS

# UMR 6205

# BRITTANY ATLANTIC MATHEMATICS LABORATORY

# LMBA



**105** members including:
**60** Researchers (20 UBS)
**25** PhD students (13 UBS)

**The LMBA brings together most mathematicians in Western Brittany. The research topics cover a large part of the mathematical fields, from theoretical aspects to the most applied, such as algebraic and differential geometry, mathematical physics, topology and groups; dynamic systems, probability and statistics; control, differential games, numerical analysis and image processing.**

**3 main themes are organized around teams and seminars:**

- Geometry and topology
- Dynamical Systems, Probability and Statistics
- Analysis, stochastic phenomena and applications

## SCIENTIFIC COLLABORATIONS

**France :** 11 research teams (mathematics, ICT, optics).
**International :** Numerous research teams (Canada, Germany, Great Britain, United States, China, Colombia, Peru, Brazil, Algeria, Vietnam, Japan, Russia, Spain, Norway).
**European Projects :** Breuds (exchange between Europe and Brazil) and Portonovo.

## INDUSTRIAL PARTNERSHIPS

**In France :** several companies from various fields (energy, defense, telecommunications, biostatistics, environment).

**LIEN**
Vers le site du LMBA

Université Bretagne Sud

cyber :

LMBA
Laboratoire de Mathématiques de Bretagne Atlantique
UMR6205 • CNRS/UBO/UBS

Brittany Atlantic Mathematics Laboratory

# Gilles DURRIEU

**Full Professor**
**Applied Mathematics and Statistics**

*“From observation to prediction”*

## BIO

Gilles Durrieu obtained his Applied Mathematics PhD in 1997 at University of Bordeaux, then did a post-doctorate under a European contract. He was Associate Professor for eleven years at University of Bordeaux before joining University Bretagne Sud as Full Professor in 2010. Multidisciplinarity and international collaborations characterize his research in the fields of multidimensional statistics and the modeling of complex systems. His work focuses on questions related to ecology (global warming, biodiversity), but also to the medical field with studies on the human genome and the location of genes responsible for complex pathologies. His research also involves the development of models associated with data sciences and artificial intelligence for the prediction and management of cyber- attacks. Since November 2022 he is the dean of the Faculty of Science and Engineering.

Link to full biography



## Core data

**25%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☒

**PhD students:** 8

**Post-doctoral fellows:** 3

**Publications:** 50 - Journal of Applied Statistics, Open Journal of Statistics, Statistical Inference for Stochastic Processes, Extremes, Journal of American Statistical Association, Environmetrics, etc.

**Conferences:** 105 (including 45 as invited guest) - SERA Brisbane (Australia), Statistics Days (Montpellier, Lille, Rennes, Brussels, Toulouse), French Mathematical Society (Vietnam), 20th International Conference on Computational Statistics (Cyprus), University of Toronto, 23rd International Biometric Conference, Genetic Analysis Workshop GAW15 (USA), etc.

**Book(s):** Handbook of Quantile Regression (Chapman & Hall /CRC Handbooks of Modern Statistical Methods 2017).

**Award(s):** Scientific excellence allowances and doctoral and research supervision grants - since 2006.

**International collaborations:** University of Toronto (Canada), University of New Caledonia, University of Pittsburgh, University of Rochester, Rockefeller and Columbia Universities - New York (USA), Santiago University (Chile), etc.

## Area(s) of research

Applied mathematics.

## Fields of expertise

Statistical learning, nonparametric estimation, shochastic process, functional regression, extreme value theory, predictive models.

## Applicative examples

Monitoring water quality based on animal behavior.
Development of mathematical indicators for ecological restoration of nickel mining sites (New Caledonia).
Modeling of defense strategies after a cyber-attack.

## Responsabilities

- Dean of the Faculty of Science and Engineering (since November 2022)
- Director of LMBA-UBS (2015-2016)
- Director of the Mathematics, Computer Science and Statistics Department (2012-2016 and 2020-2022)
- Director of the Mathematics and Statistics division (2015-2017 and 2020 - *)
- Head of the Dynamic Systems, Probability and Statistics team at LMBA (2012-2015 and 2022-*)
- In charge of training courses (Bachelor, Master and Engineering Master’s Degree Curriculum) since 2010
- Head of LMBA’s Data Science research axis (2019 - *)
- Elected member of the UBS and the University of New Caledonia (2017-2019) board of directors
- Elected member of the UBS Research Committee (2012-2016) / Education and University Life (since 2020)
- Ambition EcoDep project - Paris Seine initiative of Excellence (2020-2024)
- Responsible for the modeling part of the RecoSynth project (CNRT project 2015-2017)

## Domain

Statistics

## Keywords

Data science
Data analysis
Modelization
Extreme values
Prediction

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# EA (RESEARCH HOST TEAM) 7480

# LAW RESEARCH LABORATORY

# LAB-*LEX*

**55** members including:
**49** Researchers (18 UBS)
**36** PhD students (11 UBS)

**The Lab-LEX laboratory focuses its research on 3 major themes:**

- **Vulnerability:** understanding the concept of vulnerability applied to natural persons, legal persons, structures and spaces, and the legal instruments of vulnerability in the various fields of private law, public law, European law and fundamental rights
- **Governance:** different meanings analysis of the term territories governance (coastline, decentralization and deconcentration), European governance, corporate governance (associations, cooperatives, foundations), evolution of employment in the public and private sectors
- **Litigation:** research on the renewal of the judge's role (through litigation strategies, jurisdictional policies, modalities of legal action, understanding and enforcement of judicial decisions); the concept of risk, prevention and amicable treatment of risks; alternative dispute resolution methods.

## SCIENTIFIC COLLABORATIONS

**France :** notably the House of Human Sciences in Brittany (MSHB).
**International :** several universities (Italy, Spain, Canada, Vietnam, Mexico, Colombia, Brazil, Costa Rica, Canada).

## PARTNERSHIPS WITH THE PROFESSIONAL WORLD

Companies, local authorities and administrations, hospitals, associations, courts and judiciary, bar associations, notaries, asset managers.

**LIEN**
Vers le site du LAB-*LEX*

Université Bretagne Sud
cyber :

Lab-LEX
Laboratoire de recherche en droit EA 7480

Lab-LEX Law Research Laboratory

# Michel SEJEAN

**Full Professor**
**Private Law and Criminal Sciences**

*“Jurists must bring their added-value to society progress by promoting technologies that safeguard fredom instead pf monitoring it”*

## BIO

A graduate of the Higher Institute of Interpretation and Translation (ISIT, Paris), Michel Sejean pursued in parallel law studies and chose University Bretagne Sud in 2013 after successfully passing the “agrégation” competitive exam in private law and criminal sciences.He develops research in comparative civil law and participates in several translations of civil and commercial codes both in France and the United States. Since 2018 he has undertaken to train in cybersecurity, a discipline little known to jurists.He obtained a HarvardX certification and was selected as auditor on digital sovereignty and cybersecurity to the Institute of Higher National Defense Studies (IHEDN).

He sits at the Cyber:UBS Executive Bureau, is a Lab-LEX associate member and Full Professor at Sorbonne Paris Nord University .

Link to full biography



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 7

**Publications:** 27- La Gazette du Palais, Trans Europe Experts, Recueil Dalloz, Revue Lamy Droit civil, Bulletin Joly Sociétés, La Semaine juridique, Sécurité&Défense, Revue internationale de droit comparé, etc.

**Book(s):** 4 - Le Code de la cybersécurité, 1ère éd. 2022, Dalloz (scientific director) ;
The trilingual French-English-Arabic Civil Code, LexisNexis 2020 ; L’Europe de la cybersécurité, Trans Europe Experts 2019 ; L’index de la sécurité juridique/ The Index of Legal Certainty, Dalloz 2018.

**International collaborations:** Louisiana State University, Baton Rouge - 2021 (USA).

## Area(s) of research

Information Systems Security Law
Cybercrime Law
National Cyber Defence Law

## Fields of expertise

Domestic, European and international cybersecurity legislation

## Responsibilities

Board Member of Cyber:UBS

## Domain

Digital law

## Keywords

Cyber risk insurance
Territory cybersecurity
Numeric identity
Digital privacy
Digital sovereignty

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LEGO

Laboratoire d'économie
et de gestion de l'Ouest

# EA 2652

# WESTERN FRANCE ECONOMICS AND MANAGEMENT LABORATORY

# LEGO



**125** members including:
**100** Researchers (34 UBS)
**25** PhD students (7 UBS)

**The Western France Economics and Management Laboratory is composed of a team of multidisciplinary researchers specializing in economic and management sciences whose vocation is to help create, develop and disseminate knowledge.**

## INDUSTRIAL COLLABORATIONS

**Collaboration with Enedis:** SOLENN project (Solidarity, Energies, Innovation).

## RESEARCH CONTRACTS

- **FOOD SUSTAINABILITY:** development of sustainable food practices within a territory
- **COAGUL:** COmmunities, Activity, reGULations
- **COMPNUM:** digital skills and subjective employability of trainees and work-study students from higher education at the end of their studies
- **NUTRICHIC:** Food for the elderly at the Cornouaille Hospital Center (Quimper)
- **SESAME:** study on the «Relational Sesame» tool
- **TEXSENS:** consumer perception, meaning and use of food texture

## SCIENTIFIC RESEARCH GROUP

M@rsouin (Armorican Mole for Research on Information Society and Internet Uses).

**LIEN**
Vers le site du LMBA

Université Bretagne Sud

cyber :

LEGO
Laboratoire d'économie et de gestion de l'Ouest

Western France Economics and Management Laboratory

# Christine PETR

**Full Professor**
**Marketing and digital usages**

*“Whoever pretends to research must never stop learning”*

## BIO

Starting from her thesis defended in 1998 at Rennes 1 University, Christine Petr has questioned consumers' behavior in the worlds of tourism, art, and culture.

In 2005, she joined forces with GIS (scientific interest group) Marsouins on the digital usages issue and she has been particularly invested in E-tourism.

As a teacher-researcher, Christine Petr has worked in various institutions (IUT Saint Brieuc, IAE Rennes, IAE Tours, SciencesPo Rennes), before joining University Bretagne Sud in 2015.

She devotes her research to the effects and evolution of individual behavior in the utilization of digital tools.

Since 2018, her research themes have remained devoted to the art and tourism sectors but focus more specifically on the link between sensitivity to personal data protection and digital hygiene, which involves cybersecurity.

Link to full biography



## Core data

**25%** of the researcher's activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☒

**PhD students:** 9

**Post-PhD students:** 2

**Publications:** 32 - IJAM, Management & Avenir, JMT, Tourism Management, Arts Marketing, RAM, DM, etc.

**Conferences:** 113 - IMTC, AFM, HTSF, AIMAC, etc.

**Book(s):** 7 ouvrages, 29 chapitres - L'Urgence de l'hygiène numérique: le monde d'après les données (PUR editions forthcoming); Théories et Pratiques du marketing de la culture et du tourisme dans un monde d'innovation (2022) ; Le marketing du Tourisme (Dunod, 2010.2015), L'Accueil international: concepts et cas de management (De Boeck, 2011), 10 cas de Communication (Dunod, 2015.2020), etc.

**Award(s):** Best Paper Award JTTM 2009.

**Videography:** Experiencing Contemporary Arts: A Reexamination of Fun, Feeling and Fantasy, 2015.

**International collaborations:** Udayana University - Bali (Indonesia), La Sagesse University - Beirut (Lebanon).

## Area(s) of research

Digital Usage Analyses.

## Fields of expertise

Types and degrees of digital practice.
Digital transformation.
Perceived sensitivity of individual data.
User empowerment.

## Applicative examples

Raising users' awareness towards their personal data protection.
Users involvement in data sharing to improve collective benefit.

## Responsibilities

- Educational Manager since 2019 for the third year's Sales Marketing Bachelor.
- Member of various UBS committees (Research, CAC, CFVU ...) since 2015.
- Member of the UBS Scientific Committee of the Archipel Institute, Research Institute on the Sea and Coast (since 2019).
- Director of the IREA-LEGO Vannes Laboratory (2015-2018).
- Responsible for research projects on digital uses (since 2005).
- Scientific Council of GIS Marsouin (www.marsouin.org)
- Reviewer of international journals and congresses.
- GIT AFM (thematic interest group - French marketing association) Co-leader - Innovations and Marketing of Culture and Tourism.

## Domain

Consumers

## Keywords

Uses
Impacts
Appropriation
Addictions
Deviations
Empowerment
Trust
Marketing Information

## Contact

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Western France Economics and Management Laboratory (Associate Researcher)
Main Laboratory : CEREFIGE - European Research Centre for Financial Economics and Business Management, University of Lorraine

# Vanessa SERRET

**Full Professor**
**Management Sciences - Organizational Finance & Corporate Governance**

*“Cybersecurity cannot be limited to its technical aspects. It is important to have a multidisciplinary approach (political, economic, managerial, legal and technological) to cybersecurity in general”*

## BIO

Vanessa Serret joined University Bretagne Sud as Associate Professor after completing a thesis in portfolio management at the Institute of Business Administration (University of Aix-Marseille, 2002). Between 2000 and 2017, she was invited on several occasions to Sherbrooke University (Canada) where her research focused on shareholder democracy, then to HEC Montréal in 2017 to work on the functioning of corporate boards of directors. Her work on organizations’ governance and societal responsibility brings her to approach cybersecurity from the management and structuring of organizations’ point of view. To prevent threats and their consequences, she calls for building a highperformance organizational culture and a responsive analysis to the cost of cyber-attacks. In September 2020, she is appointed Full Professor at the IAE school of management of Metz, within the University of Lorraine.

Link to full biography



**20%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 5

**Publications:** 40 - Management international, Revue Française de Gestion, Finance Contrôle Stratégie, Revue de Gestion des Ressources Humaines, Corporate Social Responsibility and Environnemental Management, International Journal of Business and Management, Revue Française de Gouvernance d’Entreprise, Ressources policy, RIBAF, etc.

**Conferences:** 60 - CIG, AFC, EURAM, AFFI, ADERSE, RIODD, etc.

**Book(s):** 4 - Finance DSCG 2 (Dunod, 2019) ; Analyse Financière (Hachette, 2011) ; Principes d’Analyse Financière (2009).

**Award(s):** Best Paper Award EURAM 2015.

**International collaborations:** Sherbrooke University (Canada), HEC Montreal (Canada), Georgetown University (USA).

## Area(s) of research

Finance and organizational governance.

## Fields of expertise

Shareholder activism
Executive compensation
Shareholder democracy
Functioning of boards of directors
Impact of cyber-attacks on financial markets

## Applicative examples

Board of Directors’ response to shareholders regarding cyber risk management
Assessment of value destruction costs

## Responsabilities

- Head of the Finance Accounting Control team of the CEREFIGE laboratory (2020 -*)
- Elected member of the CEREFIGE laboratory board (2022 - *)
- Elected member of the Board of Directors of the International Academic Governance Association (2021-2027)
- President of the Organizing Committee of the International Governance Conference 2023
- Elected member of the research commission (2017-2020)
- Head of axis of the IREA laboratory (Research Institute of Businesses and Administrations, 2014-2016)
- Member of the Board of the UBS Research House (2007-2010)

## Domain

Cyber risk governance

## Keywords

Cyber-attacks cost
Cyber risk management

## Contact

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# DIVERSIFIED TALENTS FROM A VARIETY OF BACKGROUNDS TO SUPPORT THE LABS' MOMENTUM



## Jack NOEL

**Cybersecurity Innovation engineer**

### BIO

Jack NOEL is a former French Armed Forces Colonel; during his 30 years career he had various assignments (both in France and abroad) in Cyber/Electronic Warfare, Collection/Exploitation, Counterintelligence (including cyber) and international relations.

At UBS he is Cybersecurity Innovation engineer, Coordinator of the Cyber:UBS community and moderator with Professor Guy GOGNIAT of the cyber and smart data ecosystem.

His job is to interface between the university and socio-economic actors, businesses or state agencies in the fields of cyber education, research and training.

He also gives various courses and led the creation of UBS's first MOOC in cybersecurity.

He holds two Master's degrees (International Relations and Public Management Policies) and various higher military degrees and certificates (War College, Intelligence Academy, etc.).

# Sébastien GUILLET

**Lecturer and researcher in computer science**

*“I wouldn’t say this model is wrong, I’d say it hasn’t worked”*

## BIO

Before switching to teaching Sébastien Guillet worked on the safety of discrete-event dynamical systems formal methods. After completing his PhD in 2012 on the modeling and control of dynamic/ partial reconfiguration of reconfigurable architectures and carrying out two post-docs applied to industrial cybersecurity and home automation for the disabled, he joined UBS in 2018 as lecturer in the cyberdefence program with the goal to pass on his knowledge of programming and reverse engineering. His research work focuses on IDM and control theory, but also now on issues linked to data collection for modeling and decision-making in cyberdefence.

Link to full biography



**100%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Domain

Tactical methods modeling and digital classification related to information systems decision support.

## Keywords

NLP
(natural langage processing)
Scrapping
MITRE

## Contact

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# Jérémy BUISSON

**Associate Professor**
**Computer Science**

*“Research is also a daily intellectual humility”*

## BIO

Jeremy Buisson defended his thesis in 2006 at INSA Rennes on scientific calculation software self-adaptation. As a post-doctoral fellow at Telecom Bretagne (IMT Atlantique), he contributed to satellite embedded software architectures and their updates issues in an uninterrupted service environment (National Research Agency project). He was recruited in 2009 at University Bretagne Sud, seconded to the Ministry of Defense at the French Army military academy Saint-Cyr for 14 years and since 2023 at the Air and Space Academy.

Since 2008 his work has focused on dynamic reconfiguration, more specifically on systems of systems with an evolutionary approach and through a secure by design methodology.

He participated in the creation of the Archware team at IRISA in 2012 around these questions.

Design methodologies and engineering processes are currently at the heart of his research, whether for Defense or cybersecurity.

Link to full biography



**50%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Core data

**PhD students:** 4

**Publications:** 3 - JSS, etc.

**Conferences:** 25 - SoSE, CBSE, etc.

**International collaborations:** University of Constantine (Algérie), University of Yaoundé (Cameroun).

## Area(s) of research

Systems of systems engineering.
Secure by design.

## Fields of expertise

Software architecture.
Dynamic reconfiguration.
Model-driven engineering.

## Responsabilities

Deputy Director of the Specialised Master’s Degree in «Conduct of Operations and Crisis Management in Cyber Defence» (2015 - 2022).

## Domain

Software Engineering

## Keywords

Systems of systems
Architecture
Evolution

## Contact

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# Aurélie JAMMET

**Lecturer and researcher in management**

*“Understanding cybersecurity as a socio-technical system is the best way to help organizations improve their resistance and resilience to attacks”*

## BIO

After a PhD in management of organizations and public policies at Paris Tech, defended in 2010 on the governance of public transport policies in Brittany, she devoted herself to entrepreneurship. Aurélie Jammet joined ENSIBS in September 2019 as a teacher and became a teacher-researcher in 2021. She passes on her knowledge of management and entrepreneurship, and carries out project monitoring on digital hygiene, human risk and organizational resilience. She also coordinates crisis management and exercise seminars on human factors for cyber defense students. Her research focuses on industrial risks, in conjunction with INERIS researchers in a multidisciplinary and systemic approach to cybersecurity. The aim is to make organizations stronger, to reduce vulnerabilities or limit the impact of attacks.

Link to full biography



**50%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [X]

## Area(s) of research

Management, risk prevention, organizational resilience

## Fields of expertise

Risk analysis in relation to organizational dynamics.
Multi-level governance of socio-technical systems.
Strategy implementation within organizations.

## Domain

Human and organizational vulnerabilities to digital risks

## Keywords

Cybersecurity management
Protection and organizational resilience to digital risks
Digital hygiene
Governance and risk analysis
Socio-technical approach

## Contact

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# Jean PEETERS

**Full Professor**
**Anglophone Studies and Translation Sociolinguistics**

*“In an increasingly digital world, no freedom without cybersecurity”*

## BIO

Jean Peeters was UBS President from 2012 to 2020. During his presidency, cybersecurity became a strategic means of development and outreach for UBS. An auditor of the Institut des Hautes Études de Défense Nationale - IHEDN (National Defense Advanced Studies Institute) for its national session Digital Sovereignty and Cybersecurity (2018-2019), he is since September 2020 holder of the IHEDN research chair Cyber and Digital Sovereignty. He is also in charge of the European Erasmus Mundus master, CYBERUS, coordinated by UBS in collaboration with Luxembourg University, Université Libre de Bruxelles and TalTech in Estonia.

Link to full biography



**50%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** ☐
Application field ☐

## Fields of expertise

Initiate, coordinate and manage cybersecurity projects

## Responsabilities

Holder of the IHEDN Cyber and Digital Sovereignty Chair (2020-*).
Head of the Erasmus Mundus CYBERUS master (2021- *).
President of Université Bretagne Sud (2012-2020).

## Contact

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# Julie LASSALLE

**Independent researcher**
**Psycho-ergonomics**

*“Co-designing instruments to develop individuals’ empowerment”*

## BIO

After conducting a Cifre Orange Labs Lannion PhD in collaboration with IMT and UBS on an initial approach to cognitive science via audiovisual quality and the way in which tools constrain the user, Julie Lasalle carried on with a post-doc about fighter pilots mental load. She afterwards studied technologies appropriation on energy consumption issues and the individuals’ power to act through uses development. This power can also be applied to the cybersecurity field by transferring the same ergonomics methods to improve security within businesses and respond to contemporary problems without adding mental load. As an independent researcher, she works in close collaboration with the Lab-STICC and ensures that the studies’ findings are passed on to companies to initiate actions among different actors and mature adapted tools, rebuild work rules, bring back meaning and take into account suffering at work. Her aims are to examine power to act and organizations’ weight to develop skills and increase professional individuals’ autonomy by participating in the creation of empowering environments, whatever the activity field.

Link to full biography



**20%** of the researcher’s activity devoted to cybersecurity

**Focus:**
**Research** [X]
Application field [ ]

## Core data

**PhD students:** 2

**Publications:** 4

**Conferences:** 13

**International collaborations:** Plymouth University, Portsmouth University

## Area(s) of research

Creation of empowering environments based on co-construction methods.
Design of appropriable socio-technical systems.

## Fields of expertise

Acceptability studies.
Appropriation studies.
Activity analysis.

## Applicative examples

Creation of an interface for maritime predictive maintenance.
Promoting the acceptability of a biodegradable fishing net.
Understanding and fostering the appropriation of smart-grid technologies for energy transition.
Participating in the creation of an interface for the dynamic allocation of human-system tasks.

## Responsabilities / Collaborative projects

SEANATIC (Ademe project) - design of a predictive marine maintenance interface.
INDIGO (European collaborative project) - study of the acceptability of a biodegradable fishing net.
SOLENN (PIA Ademe) - consumption real-time consultation and development of user control.

## Domain

Psychology/cognitive ergonomics

## Keywords

Mental load
Acceptability
Power to act
Co-construction
Activity analysis
Systemic analysis
Empowering environment

## Contact

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- **CYBER PHDs**
- **AT UBS SINCE 2014**

**Delphine BEAULATON**
*Vulnerabilities automatic detection in a system of systems*

**Maria Teresa MENDEZ REAL**
*Secure application deployment on many-core architectures*

**Vincent MIGLIORE**
*Hardware cybersecurity and components design dedicated to homomorphic computing*

**Fatma SBIAA ZAYEN**
*System-level security modeling and analysis of cryptographic primitives*

**Thomas TOUBLANC**
*Industrial networks distributed sensors/actuators hardware security*

**Raounak BENABIDALLAH**
*Computer systems risk situations automatic identification: the case of embedded systems*

**Ghita HARCHA**
*Introducing randomness into hardware architectures to help secure AES encryption in an IoT context*

**Maria MUSHTAQ**
*Taking in account side-channel attacks when allocating resources within MPSoCs*

**Salwa ALEM**
*Connected industrial equipment cybersecurity: modeling, detection and temporal performance facing intrusions of cyber-physical systems within Factory 4.0*

**Hicham LALAOUI HASSANI**
*Contribution to M2M communication security by proposing a dynamic and heterogeneous security architecture*

**Nathalie BOULDOUKIAN**
*Code vulnerabilities automatic detection using graphical data mining*

**Valentin DURAND DE GEVIGNEY**
*Multimodal machine learning models detection of abnormal behavior*

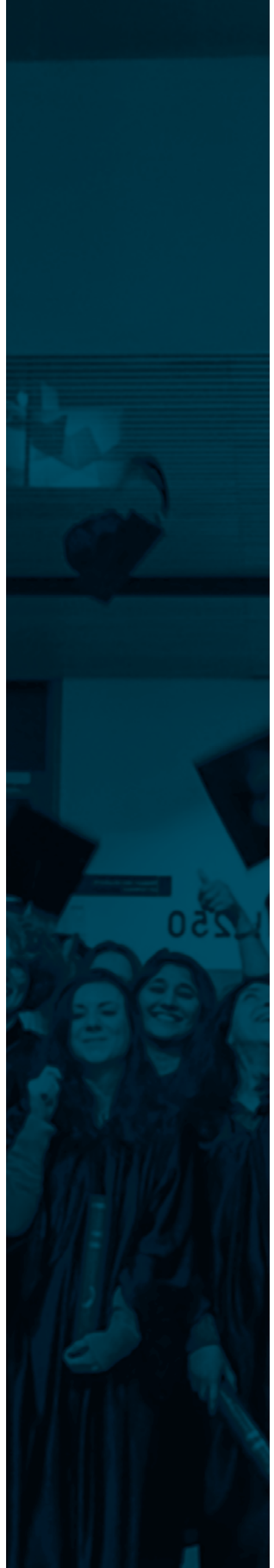
**Nan ZHANG (MESSE)**
*Systems of systems cybersecurity using model-driven requirements engineering methods*

**Timo ZIJLSTRA**
*Post-quantum cryptographic secure hardware accelerators*

**Noura AIT MANSSOUR**
*Hardware security for embedded processors against logical and physical attacks*

**Elia Christy FIKANY**
*System of systems simulation for vulnerability identification*





**Monica BUITRAGO RAMIREZ**
*Security level measuring and guaranteeing of a system of systems architecture*

**Fabrice LOZACHMEUR**
*Cryptographic extensions for embedded processors (RISC V)*

**Johann MILON**
*Study of physical vulnerabilities in embedded cryptosystems*

**Mohamed EL BOUAZZATI**
*Flexible and secure low-power software-defined radio processor*

**Nicolas GAUDIN**
*Development and evaluation of a robust RISC-V processor against auxiliary channel attacks*

**William PENSEC**
*Protecting a with DIFT processor from physical attacks*

**Philippe CHARTON**
*Formalizing crisis management exercises: a model-driven approach*

**Ahmed ELMARKEZ**
*Secure by design for the safe conception of industrial SCADA systems*

**Tianxu LI**
Contribution to the design of hardware security mechanisms for an IoT gateway secured against wireless attacks

**Qiyang LI**
*Protecting privacy when outsourcing data via mobile and IoT applications*

**Jesus Antonio SANCHEZ-RAMOS**
*Assets and threats in the secure architecture of a system of systems*

**Jeisson Andrès VERGARA VARGAS**
*Ensuring security in the architectural evolution of Web-based software systems*

**Sidbewendin Angélique YAMEOGO**
*An XAI approach to characterizing and conceptualizing fake news*

**Hongwei ZHAO**
*Secure SoC communication architecture against physical and logical attacks*

**Paul PERROTIN**
*Human vulnerability analysis in socio-technical system of systems*

**Ayoub BOURHIM**
*Development design of preventive practices in cybersecurity*

# FOCUS ON CYBERSECURITY PHD STUDENTS AT UBS

**Noura AIT MANSOUR** studied engineering in Morocco. During an end-of-study internship at LIP6 (Sorbonne University), she discovered the world of research and chose to continue with a PhD. Under the direction of Arnaud Tisserand, Guy Gogniat and the supervision of Vianney Lapôtre, she studied processor protection against physical attacks, particularly fault injection attacks. Right after her PhD, she was recruited by Secure-IC to work on circuit protection and evaluation. She would like to keep this flexibility between corporate work, teaching and research.

**Ayoub BOURHIM** arrives from the Nîmes and Montpellier Universities. He is conducting his PhD on human factors in cybersecurity with two UBS laboratories (Lab-STICC and LEGO). Supervised by Christine Petr, Julie Lassalle and Laurent Guillet, he works on the implementation of empowering environments and the perception of cyber risk. He brings the richness of his social psychology and cognitive dynamics background to study individual and organizational factors with the aim to facilitate the co-construction of new security models. He plans to continue in research and teaching.

**Monica BUITRAGO** studied telecommunications engineering in Colombia before joining UBS for a PhD on secure system architectures evaluation and design. Her work, supervised by Isabelle Borne and Jérémy Buisson, draws on security patterns to quantify the extent to which software architecture conforms security patterns such as protected entry points to a subsystem. It is to research that she wishes to devote herself.

Under the supervision of Salah Sadou, **Philippe CHARTON** is doing a PhD on the formalization of crisis management exercises using a model-driven approach. The aim is to create one or more languages for modeling exercises, with a view to automating them while applying domain-specific constraints. At the same time, he teaches cybersecurity at the ENSIBS engineering school. This return to studies fulfills his taste for research and popularization.

**Mohammed El Bouazzati** is working on a secure and flexible communication processor for connected objects. His PhD, supervised by Guy Gogniat and Philippe Tanguy, aims to protect against network vulnerabilities and attacks. He is working on designing a mechanism that will model legitimate system behavior and compare the real time data collection to detect an intrusion. After studying embedded systems and telecommunications in Morocco, he joined the Enseirb-Bordeaux engineering school, where he obtained a master's degree in electronic systems before focusing on cybersecurity. He also teaches defensive programming in the European Cyberus Mundus master's program.

Under the supervision of Guy Gogniat, Vianney Lapôtre and Pascal Cotret (ENSTA Bretagne Brest), **Nicolas GAUDIN** joined Lab-STICC in 2021 to complete his PhD on the development and evaluation of a robust RISC-V processor against auxiliary channel attacks. His aim is to graft security mechanisms onto the hardware architectures of embedded systems to counter software attacks. He plans to work in corporate R&D.

# FOCUS ON CYBERSECURITY PHD STUDENTS AT UBS

With a PhD supervised by Guy Gogniat and Philippe Tanguy, **Tianxu LI** is working on maintenance against IoT wireless attacks, whether hardware or software. After a bachelor's degree in China, he came to France to study embedded systems engineering at Polytech Montpellier. During an internship, he worked on a patient monitoring system for taking medication, as healthcare is one of the most sensitive areas for connected objects. He plans to continue research and become a teacher to share his knowledge.

Directed by Arnaud Tisserand, **Fabrice LOZACHMEUR** works with Thalès since November 2020 thanks to a Cifre PhD. His work involves creating embedded processors cryptographic extensions. He develops hardware implementations and studies encryption to extend the instruction sets and protect against physical attacks. As IOT expands, its protection becomes a major challenge, and he is very keen on attacks via auxiliary channels. He completed a bachelor's degree in digital sciences in Lorient, as well as a distance learning degree in Mathematics. He did afterwards a Cybersecurity Embedded Systems master's degree also in Lorient. He hopes to turn to teaching after his PhD.

**Nan MESSE** completed a PhD funded by the French Procurement Agency (DGA). Initially focused on system of systems security using model-driven engineering, she shifted to offer protection assistance to software architects. A Chinese student, she arrived in France in 2013 and carried out a Master's degree in SeCReTS (Security of Content, Networks, Telecommunications and Systems) at UVSQ (University Paris-Saclay). At UBS, she taught bachelor's degrees, at the UBS Technological Institute and the French Military Academy Saint-Cyr. She has now turned her attention to research and teaching in the fields of security and software engineering.



**William PENSEC** arrived at UBS in 2021 to complete a PhD on the protection of a DIFT processor against physical attacks. After studying computer science in Brest, he is now focusing on open-source processors and IoT. He also gives courses, these have confirmed his taste for passing on knowledge, and led him to envisage a career as a teacher-researcher.

**Paul PERROTIN** defended in 2022 his PhD (funded by the CyberNavals Chair) on the analysis of human vulnerability in socio-technical system of systems. Under the supervision of Salah Sadou, he focused on vulnerability representations and the design of more secure systems taking human vulnerability into account. He is currently working part-time as a post-doc.

**Benabidallah RAOUNAK** completed a PhD on automatic identification of risk situations in software systems. After a master's degree in Artificial Intelligence at the Houari Boumediene University of Science and Technology in Algiers, she uses AI technologies to support cybersecurity by guiding developers towards high-risk components. Though her profile is highly sought after in the industry world, she wishes to devote herself to research and teaching. She also strengthened her experience by teaching computer science and supervising projects.

# FOCUS ON CYBERSECURITY PHD STUDENTS AT UBS

**Jesus SANCHEZ** trained as a telecommunications engineer in Colombia. In 2023 he joined IRISA for a PhD on the security design of a system of systems. He ensures this design is secure and anticipates security measures to defend and prevent attacks in different responsive scenarios.

**Angélique YAMEOGO** began a PhD in 2022 at IRISA on an XAI approach to characterizing and conceptualizing fake news. After a master's degree in cybersecurity, during internships in Burkina Faso and Luxembourg she turned her attention to the detection of fake news, using artificial intelligence techniques. She puts her skills at the service of cybersecurity to help identify and understand disinformation campaigns using fake news.

**Hongwei ZHAO** is a PhD student at the Lab-STICC ARCAD research team. After three years of university studies in China, he joined Telecom St Etienne and obtained his engineering degree in 2020. Under the supervision of Vianney Lapôtre and Guy Gogniat, he studies robust SoC communication architectures against logical and physical attacks. He plans to become a teacher-researcher after his PhD.


**Timo ZIJLSTRA**, a Dutch student, completed his PhD at UBS on secure hardware accelerators implementation for post-quantum cryptography.
He arrived in France in 2015, after a mathematics bachelor's degree at Groningen University. His taste for algebra led him to cryptography via the Master's degree in mathematics and cryptography in Rennes.
Under the supervision of Arnaud Tisserand, he wrote his PhD (co-funded by the
Brittany Region and DGA) as a CNRS doctoral student in Lab-STICC, a CNRS-UBS joint research unit. Recruited in Bordeaux, Timo chose to bring his expertise to the corporate world.

## THEY SUPPORT US

## PEDAGOGICAL AND RESEARCH ACTORS

## CONTACT


**Cyber : UBS**

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