



UNIVERSITÉ
CÔTE D'AZUR



Initiative d'Excellence

Activity report 2023

**Academy 1 "Networks, Information,
and Digital Society"**

ACADEMY 1 NETWORKS, INFORMATION, AND DIGITAL SOCIETY

Key actions in 2023



SCIENTIFIC AMBITIONS

- Design and experiment with advanced communication networks and quantum information systems
- Develop Université Côte d'Azur's excellence in digital sciences
- Improve understanding of the transformation brought about by the digitalization of society

RESEARCH FIELDS

Advanced communication networks
• Electronics and photonics • Digital science • Distributed big data • Digitalization and society • Digital law

[Academy 1](#) Networks, Information and Digital Society brings together over 200 researchers and teachers from 17 [research entities](#).

Its aim is to support the emergence of innovative and ambitious research projects in the fields of digital science and society, to encourage transdisciplinarity and to strengthen the influence of Université Côte d'Azur, both locally and internationally.

In 2023 Academy 1 supported:

- [Seven research projects](#), with a call for Research proposals, including the recruitment of two postdocs, for a total of €307K;
- [Five doctoral students, recipients of the DocWalker scholarship](#), which funds visits of between one and three months to Australia, Chile or the United States, for a total of €22.1K ([testimonial 2022](#));
- [Ten Forum Numerica](#) scientific seminars devoted to the digital sciences and their impact on society and humanity;
- Five scientific events: [AlgoTel/CoRes](#), [CPAIOR](#), [JOBIM](#), [IAREP-SABE](#), [GDR TAL-RADIA](#), up to €11K;
- The participation of three PhD students in [Thematic Schools](#) in France, Belgium and Denmark, for €2.6K;
- Visits by researchers from the United States and Vietnam, at a cost of €7.5K;
- The recipient of the 2022 call for Postdoc proposals, Ankica Barisic, who participated in the international workshop Haapie 2023, where she and her team won the [prize for best paper](#).

Academy 1 also organized a [science day](#) in March 2023, focusing on a few flagship projects.

Examples of projects

ESTHETICS PROJECT

Exploring the functional structure of the retina and the role of inhibitory interneurons (amacrine cells) using closed-loop spatio-temporal stimulation. An experimental and computational approach.



Bruno CESSAC, theoretical physicist, neuroscience modeler, Inria Research Center



Experimental and computational neuroscience, Mechanisms of vision



Retinal network dynamics, Stimulus-response adaptation



Jean-Sébastien VAYRE, sociologist, GREDEG



Social cognition, Multi-Agent Systems, Mathematical modeling



Epistemic vigilance, Cooperation, Competition

MOVICI PROJET

Modeling epistemic vigilance and its institutions in the communication of information shared on the Internet, with the aim of limiting the harmful effects of misinformation.

ALGETHERA PROJET

Exploiting the algebraic properties of therapeutic molecules by breaking down proven molecules into promising fragments, and reconstructing new molecules from these fragments.



Gilles BERNOT, professor of computer science, I3S



Theoretical computing, Category theory, Biochemistry, Graphs



Pharmaceutical molecules, Therapeutic predictions, Algebra, Virtual Screening



Laurent RODRIGUEZ, Associate Professor Université Côte d'Azur, LEAT
Stéphane BARLAND
CNRS Senior Researcher, INPHYNI



Bio-inspired artificial intelligence, Nonlinear optical system



Interferometry, Semiconductor lasers, Bio-inspired artificial intelligence

BRAINMIX PROJECT

Developing brain-inspired unsupervised multimodal learning methods for the design of a nonlinear optical system for high-precision measurement of fast movement.



FOCUS - Towards a scalable federated model to describe the user profiles in interactive systems

Objective:

The project tackles the challenge of describing user profiles in interactive systems in order to be able to respond to changes in user interactions brought about by technological advances. The aim is to create an extendable user profile model that seamlessly integrates user information.

The project aims to understand the multiple characteristics of users, to establish a methodology for indexing this information, and to exploit these data in the design of adaptive interactive systems, adjustable to various profiles, while taking into account their temporal evolution.

One notable application is to define a driver model suitable for takeover request (TOR) scenarios in the context of autonomous vehicles.

Method:

This project uses model-driven engineering (MDE) to meet the complex challenges of interactive systems, particularly in the modeling of user profiles.

It contributes to a holistic approach formalized by the User Profile Meta Ontology (UPMO). A resource description framework version of the UMPO facilitates the description of user information and supports reasoning through navigation in knowledge graphs.

The project proposes an iterative modeling process to support the evolution of user profiles, by identifying, modeling and refining user characteristics.

Academy 1 funded Ankica Barišić's postdoctoral year on this joint project carried out by the Wimmics and SPARKS teams.

Ankica Barišić and her team won the prize for best paper at the international workshop [Haapie 2023](#).

[Video presentation of the project](#)



Ankica Barišić
I3S | Inria Wimmics/SPARKS



Human-Computer
Interaction, Interactive
Systems Engineering,
Knowledge Graphs



User profiles, Interactive
systems, Knowledge
modeling, Adaptive
systems

Learn more about Academy 1

