SN
DIGITAL
SCIENCES

The SN Centre covers a wide range of subjects to provide an integrated approach to the whole Digital Science chain, from pure research to the development of technologies: pure and applied mathematics, I.T., automatic signal theory, certain aspects of electronics, etc.

SUBJECT AREAS

- Mathematics
- Engineering Science (SPI)
- Information and Communication Science and Technology (ICST)

SN CENTRE KEY FIGURES

- **217** PhD Students
- **154** HDR
- **8** Laboratories
- **17** European projects (ERC, FEDER, H2020...)

RESEARCH AREAS

Data science

In an era of what we call "big data", this area of work proposes to develop new methods for exploiting and analysing all types of data (text, image, sound, video, real-time streaming, etc.). It is based on collaborative work between specialists in different domains: statistical and analytical modelling, optimisation, learning, mining, data management and viewing, etc.

Digital security

This area of work covers the individual authentication and data security problems that naturally occur in a digital network (electronic messages, payment and voting, etc...). Normandy has a key expertise in mathematical logic and algorithm cryptography, biometrics and privacy protection.

Connected systems, services and objects

This area of work aims to propose tools for designing and controlling connected cyber-physical systems (smart sensor networks, robot fleets, tourist journey customisation services, etc.). Experts in artificial intelligence, optimisation, robotics and distributed algorithms are involved.

Discrete models and structures

This area of work focuses on the basic of computing and algorithm design and analysis. It benefits from a recognised tradition in Normandy for a bi-disciplinary culture between mathematics (algebra, arithmetic, probabilities) and theoretical I.T. (algorithmics, formal and combined calculation).

Analytical structures and models

Here, the work is focused on the modelling of real phenomena (health, energy, physics, insurance, engineering, etc.) by continuous structures. It covers issues such as simulation and digital processing and involves specialists in digital analysis, signal and image processing, scientific calculation and high performance calculation.

TRAINING

The Digital Science Centre (SN) offers 89 degree courses. Qualifications vary from DUT (technology diploma) to PhD and include engineering, Bachelor's and Master's degrees. Some are available on a work/study basis. The specialities on offer are closely linked to the research topics being developed in the laboratories.

The SN Centre's training offer has changed recently to become more international. A new INSA school has opened in Fez, Morocco. ENSICAEN offers a dual degree, specialising in I.T., with the Universitá degli Studi di Salerno in Italy. The MAM – Mathematical Modelling and Analysis Master's degree course from the University of Rouen has 4 European partners (Augsburg in Germany, Naples in Italy, Seville in Spain and Tomsk in Russia).

The SN Centre works with the MIIS doctoral school (Mathematics, Information, Systems Engineering).
Some 40 PhD theses are defended each year, a quarter of the doctoral students are international and a third studied for their Master's degree in Normandy.

The Centre's researchers are regularly involved in organising PhD-level international schools in Normandy and worldwide, such as the CIMPA schools (International Centre for Pure and Applied Mathematics).

PARTNERSHIPS

The Centre's activities make a strong contribution towards the development of the digital world in Normandy via the creation of a range of start-ups or support for innovation through close collaboration with young SMEs.

The Centre is heavily involved in the technological challenges of Normandy, some sponsored by the regional council, others by the competitiveness clusters: connected agriculture, e-tourism, mobility 2.0, health and digital technology, digital security, factories of the future 4.0 and digital transition.

The researchers are able to use the intensive computing resources of CRIANN (Normandy Regional Centre for I.T. and Digital Applications), which is also part of the MSO (Modelling, Simulation, Optimisation) network headed by Labex AMIES (Agency for Mathematics in Interaction with Companies and Society).

Competitiveness clusters
- Mov'eo
- TES

Federative research structures
- FR 3638 - Normastic
- FR 3335 - Normandie-Mathematics

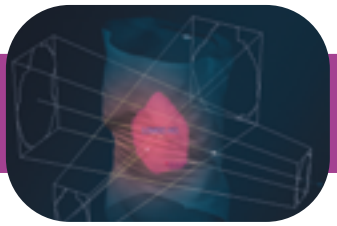
Projects in collaboration with international laboratories
- H2020 NOMADS
- PICS CNRS "Diophantine Geometry"
- H2020 EURHISFIRM

Associated International Laboratories
- French International Unit (IMPA Pure and Applied Mathematics Institute, Brazil)
- LIA INFINIS (Basic I.T., logic,languages, verification and systems, Argentina)
- Chinese-French fundamental mathematics laboratory (LSFMF, China)

Common laboratory resulting from collaboration with the industrial world
- LabCom INKS (INtelligent notebooKS)

Industrial chairs in collaboration with the industrial world
- Chair of excellence "Driverless connected vehicle" with 11 SMEs
- CISCO teaching and research chair – CESI – VINCI Energies "Industries and Services of the Future

Other industrial partners
- NXP
- Orange
- ELITT
- FIME
- Ipdia
- Airbus
- Thales
- Safran



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