



Mathematical Imaging and Spatial Pattern Analysis

Master of Science

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**INSPIRING
INNOVATION**
SINCE 1816

A Master of Science (National Masters' Degree)
*Accredited by the French Ministry of Higher
Education and Research at the **École Nationale
Supérieure des Mines** of Saint-Étienne, France*

 **Taught in English**

A new opportunity for international students

- Taught in English
- A one year programme
- A diploma of Master of Science
- A key step for PhD studies

A one-year programme taught in English designed to provide the basic and advanced knowledge in Mathematical Imaging and Geometric Pattern Sciences. Emphasis is placed on the mathematical and computational aspects.

Course structure

Theoretical modules with training sessions:

- Image modeling, image processing and image analysis.
- Color and multispectral image processing.
- Advanced mathematical imaging.
- Geometry for spatial pattern modeling and analysis.

Tutored laboratory project:

- Literature survey on a selected topic
- Theoretical and practical research work with theoretical and practical
- Project defense in March (report and oral examination).

A 6 months internship in a company R&D center or in a research laboratory:

- Each MSc. Student is supervised by a Professor and an internship scientist.
- The internship leads to a written MSc. Thesis to be defended in September during an oral examination.

PhD Opportunities

- Color Logarithmic Image Processing
- Random Mosaic Modeling by means of Thresholded Spatial Random Fields
- Stochastic Geometric Modeling and Characterisation of Anisotropic Particle Patterns

Internships Opportunities

- Mac Gill University (Canada): Geometric Random fields applied to Brain MRI images
- LVMH Corporate Research Center (France): Skin Color Appearance Modeling and Characterisation
- General Electric Corporate Research Center (USA): Perceptual Image Processing

Job Opportunities

- General Electric: R&D scientist
- Philips: Applied researcher
- University or Higher Academic Institutes: Researcher and/or Professor





Requirements for applicants

Applicants should hold:

- A completed first year Master in Mathematics or Computer Sciences or an engineering degree (or a registration in the final year in one French graduate School) or an equivalent diploma

Admission:

- File selection and interview
- The decision of the admission committee will be communicated to each applicant
- Prior successful completion of a first year of a Master's Degree in theoretical and / or applied science, or equivalent diploma (at the home university or Ecole des Mines) / or 240 ECTS validated
- A good command in English is mandatory

Contact:
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With the collaboration of the research team in Mathematical Methods for Image and Spatial Pattern Processing, Analysis and Modeling

Nb PhD Students and post-doctorate fellows: 6

Industrial partnerships: Biomérieux, CEA, General Electric, LVMH, Philips, Siemens, Thales



 **La Région**
Auvergne-Rhône-Alpes



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