DATA ANALYSIS
AND PATTERN CLASSIFICATION
MASTER OF SCIENCE

ACCREDITATION
Program accredited by the French Ministry of Higher Education and Research.
This program can lead to an enrollment in a PhD program.

KEY WORDS
Automatic classification, multi-sensor data, signal processing, statistical models, data fusion, computer vision, data analysis, content-based indexing and retrieval, multimedia databases.

SCHOOL PROPOSING THE MASTER
Telecom SudParis

LOCATION
Telecom SudParis has a 12-acre campus situated 35 minutes from the center of Paris and 20 min away from the gorgeous "Forêt de Fontainebleau", thus offering the advantages of both the city and the countryside.

STRONG POINTS OF THE SCHOOL
Telecom SudParis is one of the French leading Graduate Schools of Engineering in the field of Information Technology. More than 60 different nationalities are represented on its campus. Telecom SudParis is a flagship in the French research environment.
Strong links with industry have made it possible for Telecom SudParis to reach excellence in active pedagogy, project-based teaching and top-level research. Telecom SudParis, as a member of Institut Mines-Telecom, is a founding member of the Paris-Saclay University.

INDUSTRIAL PARTNERS
CNES, Renault, Orange, Netral, EDF, Onera, Thales, IFP, Morpho, Miriad Technologies, Self Trade, Asteck, Société générale, Groupe Cyber Sollac Dunkerque, Crédit Agricole, Epargne salariale SA, Air liquide, SNECMA, Clipac, Alcatel, CFT Institut Pierre Simon Laplace, Centre des Environnements Terrestre et Planétaires (CETP/IPSL), Commissariat à l'Energie Atomique (CEA).

LANGUAGE OF TEACHING
This program is taught entirely in English during the first year with intensive French courses in parallel. The second year lectures are taught in French.

ENVIRONMENT
In several applicative areas such as telecommunications, medical imaging, virtual reality, telemonitoring, biometrics, bio-informatics, environmental sciences, banking, insurance, data mining (textual, multimedia), great amounts of data are captured through specialized sensors and must be processed and further analyzed for different purposes related to the application.
Processing such volumes of data, often noisy or degraded, is a big challenge: raw data must be pre- processed to remove the noise, pertinent information (features) must be extracted from the data, which must be stored appropriately and accessed efficiently; this requires to model data in order to label it for classification or prediction purposes. The high-quality courses and projects supervised by professors of TSP and industry-lecturers ensure the possibility of applying for a PhD position in a research laboratory, or a research and development position in industry.

COURSE AIMS
This MSc degree meets the needs of data processing contained in megabases. It is designed to provide the tools allowing processing of all types of real data captured by sensors used in the sectors of genomics, geolocalisation, economics, telemedicine, biometrics, etc.
At the end of the two-year program, students will be able to model real and noisy data, to retrieve information in very large databases, and to conceive complex systems based on such techniques.

PROGRAM
1st semester
> Computer Science
> Effective Communication
> Probability and Statistics
> Optimization methods
> Application of Statistical methods
> French as a foreign language

2nd semester
> Pattern Recognition & Biometrics
> Signal Enhancement Methods
> Safety and secure Operational Systems
> Advanced Statistical Techniques
> Scientific Project
> French as a foreign language

3rd semester
> Reconnaissance des formes, méthodes neuronales
> Mise en œuvre des méthodes de reconnaissance des formes neuronales
> Bases de données
> Applications Industrielles du traitement statistiques de données
> Modélisation avancée
> Traitement d'image
> Outils d'observation, capteurs

4th semester
This semester is spent developing a research project (Master thesis) in an industrial or university R&D laboratory

ADMISSION REQUIREMENTS
First-class Bachelor's degree or a four-year degree in one of the academic topics offered by the Master's course. Good background in computer science and in mathematics are required.

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LANGUAGE REQUIREMENTS
English
When applying, students must provide evidence of proficiency in the English language. This could include:
- having English as mother tongue
- work/studies in an English-speaking country
- English language official qualification such as:
  - TOEFL: 550/677 (Paper-based) or 213/300 (Computer-based) or 79/120 (Internet-based)
  - IELTS: 5.5/9
  - TOEIC: 750/990
  - Cambridge: CAE (Certificate of Advanced English)

French
Students must provide evidence of proficiency in French language by providing a DELF score of B1. Intensive courses of French are available for students prior to the beginning of the program. French language classes are included in the programme.

APPLYING
On-line application at:
http://www.telecom-sudparis.eu/msc

COMPETENCES ACQUIRED
High scientific competencies in the related field.
Solid know-how in the practical use of the concepts and technics. Interdisciplinary approach to the field reinforced by a global vision of the different practical situations.
MSc training also focuses on teamworking, communication skills, innovation and project management.

TYPICAL JOBS
Data Scientist, big data, E-health, telemedicine, medical, imaging, bio-informatics, Biometrics, Video-Surveillance, Human computer interaction, Climatology, Geology, automotive, aerospace, researchers in academic and industrial labs.

COST
11,000 Euros
5,000 Euros Europe and Erasmus zone

SCHOLARSHIPS
Scholarships are available depending on academic records and countries of origin (companies, governments, embassies etc.). Internships are paid and can help with living expenses during the last semester.

DURATION
2 years.

LODGING
Located at the heart of the campus, the Maison des élèves (MAISEL) has 902 comfortable bedrooms and small flats providing accommodation for all students who wish to live on-campus. The monthly rate varies depending on the type of accommodation. Students may be able to claim housing benefit subject to certain conditions.
Services included:
- Private bathrooms
- Shared kitchens
- Washing machines and tumble-dryers • Ironing rooms
- TV / Games rooms
- Internet

CONTACT
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Institut Mines-Télécom