



### DOUBLE MASTER: COMPUTER SCIENCE

MOSIG, l'Université Grenoble Alpes (UGA), France

&

MSc Computer Science, National Institute for Astrophysics, Optics and Electronics (INAOE), Mexico

### Outline

- Double Diploma
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  - Optional courses at UGA
  - Requirements
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  - Process
- UGA
  - General information
  - Research Topics

### Double Diploma

- Students in this program will obtain a double master diploma:
  - UGA-MOSIG
  - INAOE-Master CS

#### **Program Structure**

- 1<sup>st</sup> year at INAOE
  - Basic courses
  - Optional courses
- 2<sup>nd</sup> year at UGA semester 9 and 10
  - Optional courses (in English)
  - Research project

### 1<sup>st</sup> year – Semester 7 (Fall Term)

	INAOE	EC	UGA-MOSIG	ECTS Credit s
Basic (obligatory) courses	Mathematics for CS	6	Mathematics for CS	3
	Design and analysis of algorithms	6	Algorithms Problem Solving	3
	Artificial Intelligence	6	Programing Lang and compilers design	6
	Machine Learning	6	Software Engr.	3
			Intro to visual computing	3
			Principles of operating systems	6
Seminars	Research seminar 1	2	Technical writing and speaking	3
Optional courses			Programming project OS or Programming project (Compiler design)	3
Total credits		26		30

# 1<sup>st</sup> year – Semester 8 (Spring/Summer Terms)

	INAOE	EC	UGA-MOSIG	ECTS Credit s
Optional courses	Option 1 - spring	6	Option 1	3
	Option 2 - spring	6	Option 2	3
	Option 3 - spring	6	Option 3	3
	Option 4 - summer	6	Option 4	3
	Option 5 - summer	6	Option 5	3
			Option 6	3
			Option 7	3
			Option 8	3
Spring seminar	Research seminar 2	2	Research project	3
Summer seminar	Research seminar 3	2	Research methodology	3
Total credits		34		30

### 2<sup>nd</sup> year – Semester 9 (Fall Term)

	INAOE	EC	Option MOSIG- HDWI	ECTS Credits	Option MOSIG- DSAI	ECTS Credits
Obligatory courses			Computer graphics	6	Knowledge rep. and reas. (can be revalidated)	6
			Robotics (can be revalidated)	6	Large-scale data management and distributed system	6
			Computer vision (can be revalidated)	6	Machine Learning Fundamentals (can be revalidated)	3
					Adv. Algorithms for Machine Learning and data mining(can be revalidated)	3
Optional courses	Option 1	6	Option 1	6	(*)Option courses	12
	Option 2	6	Option 2	6		
Research Project (Thesis)	Thesis 1	18				
Total credits		30		30		30

# 2<sup>nd</sup> year – Semester 10 (Spring/Summer Terms)

	INAOE	EC	Grenoble	ECTS Credits
Spring project	Thesis 2	20	Research project	30
Summer project	Thesis 3	10		
Total credits		30		30

## Optional Courses at UGA - 2<sup>nd</sup> Year

- Computer graphics
- Large-scale data management and distributed systems
- Augmented and virtual reality: innovative interaction techniques
- Human in the Loop
- Multi-agent systems
- Information Visualization
- Machine Learning for Multimodal Data
- Reinforcement Learning
- Kernel Methods for Machine Learning
- GPU computing
- Model Selection for Large-scale Learning

#### **Research Project**

- The research project (master thesis) will be done at UGA in one of their research labs
- There will be and advisor from UGA and an advisor from INAOE
- The project will be defined according to the student's interests and in collaboration between UGA-MOSIG professors and INAOE-CCC researchers

#### Requirements

- Good grades in the first term (> 8.5)
- Good level of English (TOEFL > 500)
- Focus on Artificial Intelligence and Robotics (most courses and thesis in these areas)
- Interview with admission committee

## Support

- Financial support for the research project at UGA (approx. 3000 euros)
- Opportunities for additional financial support (French embassy, MIAI)
- Accommodation at the university
- Medical insurance
- Personal help from person in charge of the double diploma at UGA

### Procedure

- Apply for the double diploma (by the end of December 2023)
- 2. Selection process (January 2024)
- Register for first year (January 2024) will obtain a Diploma from UGA
- Apply for Visa and Accommodation (April-May 2024)
- Register for 2<sup>nd</sup> year at UGA (no cost for double diploma students)
- 6. Start courses at UGA (September 2024)

### Application

- Send an email to Luis Villaseñor (villasen@inaoep.mx) and Enrique Sucar (esucar@inaoep.mx) before November 30, 2023, expressing your interest in the double diploma and including:
  - The proposed area of research for your thesis
  - Your score/date in the TOEFL exam
  - Your Kardex for the 1<sup>st</sup> term at INAOE

#### l'Université Grenoble Alpes (UGA), France



### UGA

- Université Grenoble Alpes (UGA) is the result of the coming together of stakeholders in higher education and research in Grenoble
- It brings together 59,000 students including 10,500 international students, 3,000 PhD students, and 7,800 staff on several campuses
- The Idex project "Université Grenoble Alpes: university of innovation" was awarded the "Initiative d'excellence" label in 2016. This distinction is reserved for a dozen university sites in France.
- More info: https://www.univ-grenoble-alpes.fr/about/

#### MOSIG: Master of Science in Informatics at Grenoble

- The objective of the Master of Science is to offer to all students, regardless of country of origin, access to world-class graduate training in areas of Informatics where the scientific research community in Grenoble is particularly strong.
- The Master of Science in Informatics at Grenoble is a highly competitive, two-year European Standard (LMD) graduate program.
- More information: https://mosig.imag.fr/

#### MOSIG: Master of Science in Informatics at Grenoble

- Courseware is offered in English, and the program is open to top students holding a BSc in Computer Engineering or Computer Science (European LMD licence), a degree in engineering, or an equivalent degree, from any country.
- The double diploma with INAOE includes the following two areas of specialization:
  - Data science and Artificial intelligence (DSAI)
  - Human and digital world interactions: robotics, augmented and virtual reality, perception (HDWI)

### MOSIG: Master of Science in Informatics at Grenoble

- The research project will be done at one of the associated laboratories:
  LIG, LIG, LJK, ...
- Some areas of research:
  - Artificial intelligence and robotics
  - Multimodal perception and sociable interaction
  - Interpretation and modeling of images and videos
  - Machine learning: applications to vision, audio and text
  - Natural language processing and information retrieval

#### **Additional Information**

- Questions regarding the program and application process:
  - L. Enrique Sucar, esucar@inaoep.mx
- Questions regarding the University of Grenoble and MOSIG master:
  - J. Ernesto GOMEZ-BALDERAS, jose-ernesto.gomez-balderas@univ-grenoblealpes.fr