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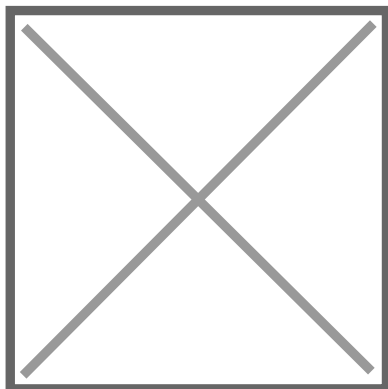
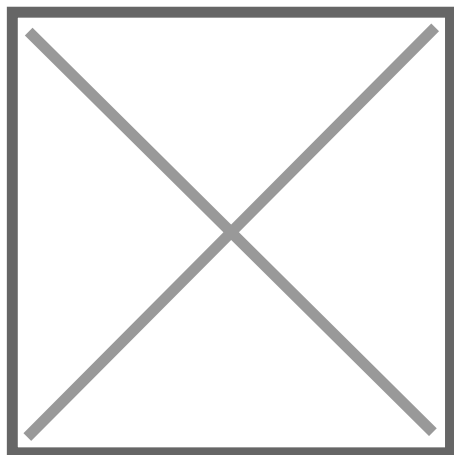
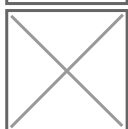
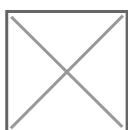
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Add to Compare

M2 Computer and Network Systems (CNS)- Systèmes Autonomiques (SA)



Master's degree

Specialisation Computer Science

Enrolment type

Full-time academic programmes

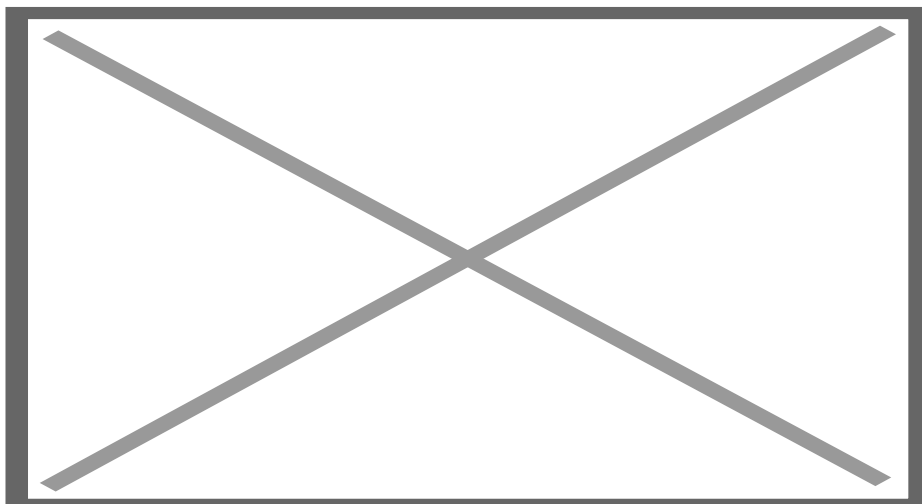
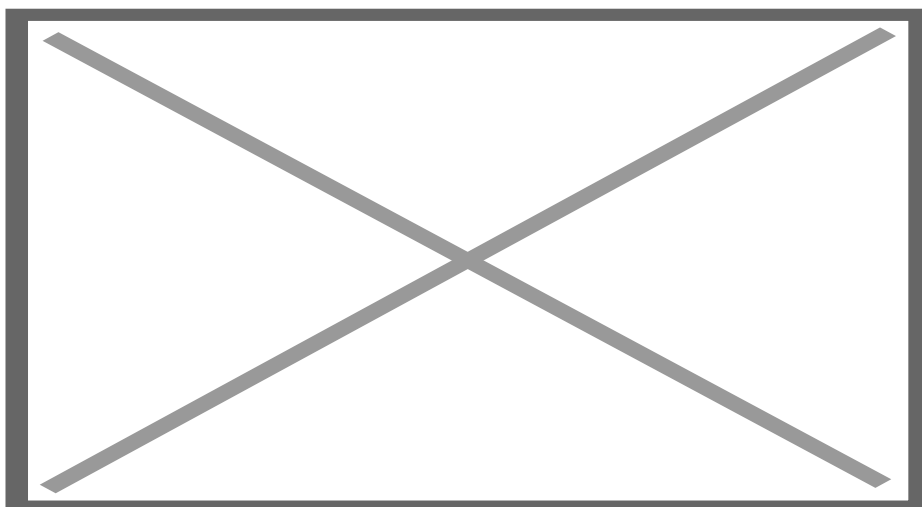
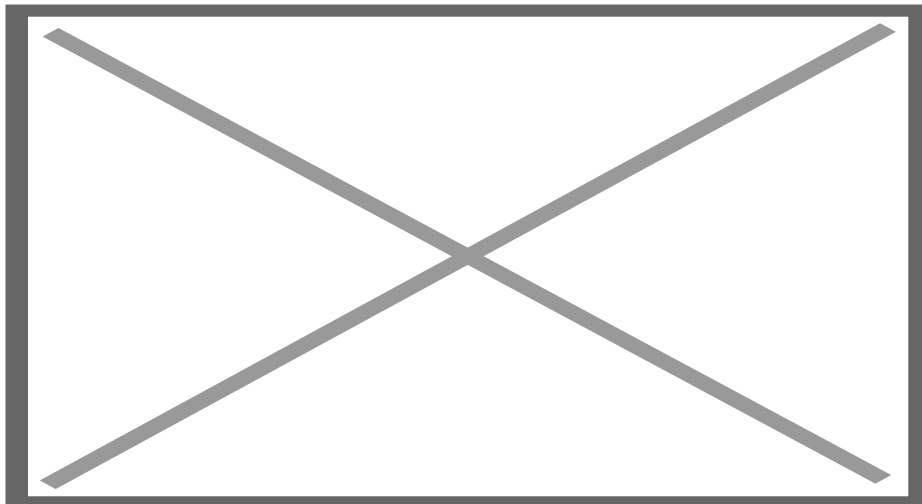
Language(s) of instruction

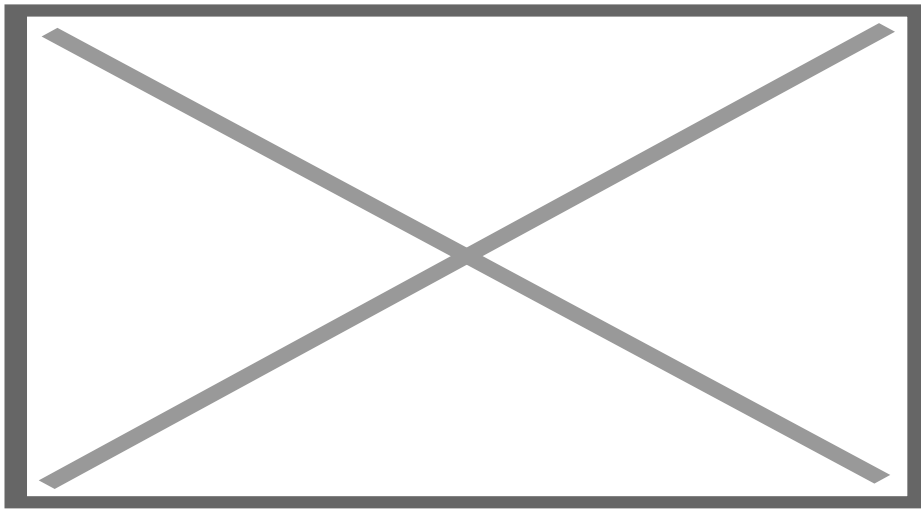
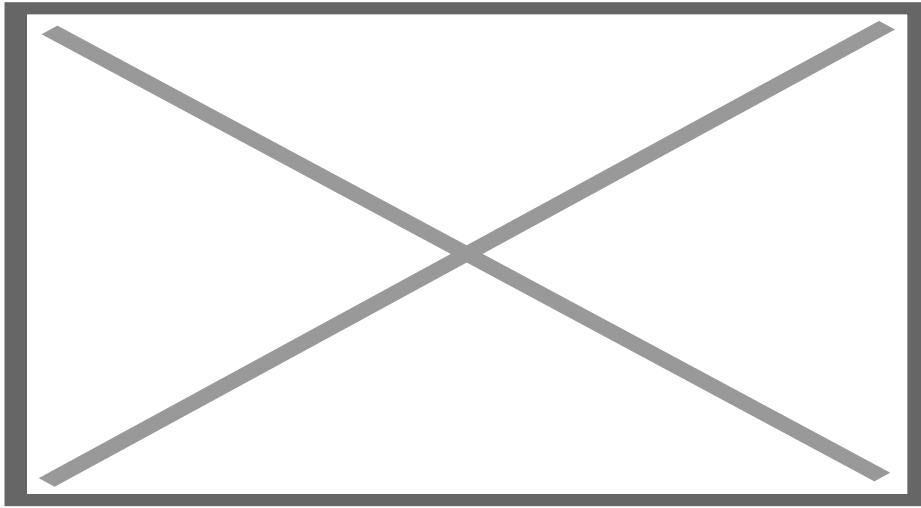
English French

The program aims to provide students with the scientific foundations necessary for the design of autonomous systems, i.e., systems capable of self-management, self-organization, self-protection, and self-optimization. From a scientific perspective, the objective is to present the necessary knowledge regarding performance models (automata, Petri nets, queues, etc.); optimization methods (game theory, multi-criteria optimization including energy, etc.); formal methods for design, verification, and testing; artificial intelligence (machine learning, reinforcement learning, multi-agent systems, etc.).

[Télécharger la fiche détaillée](#)

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■ ■

Information

- [Overview](#)
- [Application requirements](#)
- [Schedule](#)

Présentation

Skills

- Master the basic concepts of computer systems.
- Describe the functional requirements of computer systems in specifications.
- Apply basic concepts to propose architectural and technical solutions.
- Analyze the operation of complex computer systems.
- Propose innovative solutions.
- Justify technical and technological choices.

Objectives

.The Master's degree trains specialists capable of designing and optimizing autonomous, intelligent, and distributed computing systems. It prepares students for careers as systems architects, research and development engineers, or researchers.

Débouchés

Career prospects

After a Master's or Master's + PhD: researcher or lecturer

After a Master's or Master's + PhD: engineer (R&D, control, production, etc.)

Project Manager

Research Engineer

Research or Design Engineer

Design engineer

Research & Development Engineer

Further Study Opportunities

Research officer

Head of project/mission

R&D researcher or data modelling and analysis expert in leading-edge companies or laboratories.

Data Scientist, Data Analyst, Ingénieur·e en Machine Learning dans des secteurs innovants (tech, finance, santé, énergie, etc.) ;

PhD

PhD thesis

Calendar

Start of programme (indicative date)

04/09/2026

Admission

Capacity

Available Places

25

Target Audience and Entry Requirements

The Master 2 is accessible to students holding the Computer Network Systems M1 and, upon consideration of their file, to students holding an M1 in Informatics, an undergraduate degree (over 4 years) or Master's degree in Computer Science, an M2 in foreign Computer Science, or an engineering degree with a substantial informatics component. All applications are reviewed by the admissions panel.

Période(s) de candidature

Inception Platform

From 01/01/2026 to 15/02/2026

From 01/05/2026 to 15/06/2026

Supporting documents

Compulsory supporting documents

Rank of previous year and size of the promotion.

Copy diplomas.

Motivation letter.

All transcripts of the years / semesters validated since the high school diploma at the date of application.

Curriculum Vitae.

Detailed description and hourly volume of courses taken since the beginning of the university program.

Additional supporting documents

2nd letter of recommendation (compulsory for candidates who have already been enrolled in higher education in France before).

Letter of recommendation (compulsory for candidates who have already been enrolled in higher education in France before).

Referring contact information (compulsory for non-international applicants).

Certificate of English level.

Certificate of French (compulsory for non-French speakers).

VAP file (obligatory for all persons requesting a valuation of the assets to enter the diploma).

Document indicating the list of local M2 choices available here : <https://urlz.fr/i3Lo>.

Supporting documents :

- Residence permit stating the country of residence of the first country
- Or receipt of request stating the country of first asylum
- Or document from the UNHCR granting refugee status
- Or receipt of refugee status request delivered in France
- Or residence permit stating the refugee status delivered in France
- Or document stating subsidiary protection in France or abroad
- Or document stating temporary protection in France or abroad.

Programme

Apprentissages fondamentaux

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Outils Méthodologiques	2.5	Semestre 1		18				

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	practical class	directed study/practical class
■								

Outils Méthodologiques

ECTS : 2.5

Semester: Semestre 1

Detail

Directed study: 18

Language(s) of instruction

Français

Remote teaching

non

Programme/contents

L'objectif de cet enseignement est d'habituer les étudiants à utiliser certains outils méthodologiques puissants pour, entre autres, trouver un stage adapté à ses intérêts et ses capacités, développer une problématique pour le mémoire dans le cadre d'un stage en entreprise, et faire un état de l'art des travaux accessibles répondant à une problématique.

Overall organisation

Travail régulier en séances et à la maison.

Type of assessment

Evaluation Terminale

Mastérial	2.5	Semestre 1	0	18
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Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
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Mastérialles

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 0

Directed study: 18

Language(s) of instruction

Français

Remote teaching

non

Learning objectives

Réalisation d'un projet par équipes permettant d'intégrer les connaissances présentées dans les différents cours du semestre.

L'objectif est ainsi de développer la capacité de modéliser et résoudre un problème appliqué en utilisant des méthodes vues en cours, de travailler en équipe et de présenter un travail d'équipe.

Overall organisation

Un projet de conception d'un système complexe est décomposé en une demi-douzaine de sous-projets pour des équipes de trois étudiants encadrés par des enseignants de différentes UE. Des réunions sont organisées très régulièrement, entre les équipes et leurs encadrants, et pour la coordination entre équipes. Les projets font l'objet de soutenances.

Type of assessment

Evaluation Terminale

Systèmes et réseaux autogérés

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
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[Réseaux](#)
[Autonomique](#)

2.5

Semestre
1

18

Réseaux Autonomique

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Internet network architecture and TCP/IP protocols.

Learning objectives

The objective of this course is to present the key concepts and techniques for the design and engineering of autonomic systems and, more particularly, the autonomic networks (SON: Self-Organizing Networks).

This course covers techniques for monitoring, analyzing, and controlling complex systems, such as network infrastructures. The aim is to design future large-scale IT infrastructures with a high level of resilience and quality of service despite their complexity and heterogeneity.

Overall organisation

Projects, Final exam.

Type of assessment

Evaluation Continue non Intégrale

[Software Defined Networks](#)

2.5	Semestre	18
	1	

Software Defined Networks

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Internet network architecture and TCP/IP protocols, QoS.

Programme/contents

After presenting traditional IP network architectures, this course highlights the need for better control of existing IP-based networks. In particular, the benefit of transforming hardware function into software that can be programmability instrumented (NFV: Network Function Virtualization). The SDN architecture and the associated protocols, called OpenFlow and Netconf/Yang, are detailed. The different implementations are presented. Specific optimizations of SDN and NFV are discussed. Finally, a more general picture of SDN in the context of Cloud Computing, Edge Computing, Mobile Cloud, and Fog Cloud is presented.

Learning objectives

The goal of this course is to introduce recent advances in the architectures of computer networks, from high-performance hardware-based functions to commodity programmable hardware and software functions that are executed in back-end datacenters.

Bibliography

Edelman, J., Lowe, S. S., & Oswalt, M. (2018). *Network programmability and automation: skills for the next-generation network engineer*. " O'Reilly Media, Inc."

Type of assessment

Evaluation Continue Intégrale

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Administration et développement de systèmes pour les centres de calcul et de données	2.5	Semestre 1	18					

Administration et développement de systèmes pour les centres de calcul et de données

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Prerequisites

- première expérience d'administration système sous environnement UNIX/Linux
- première expérience de programmation C et Python

Programme/contents

- shell distribué (ClusterShell API) : programmation événementielle,
- gestion de configuration (Puppet) : ressource abstraction layer,
- gestion de message (Kafka, Protobuf) : sérialisation,
- gestion et distribution de services virtuels ou en conteneur (Kubernetes, Openstack) : élection, consensus, migration,
- systèmes de fichiers parallèles et hiérarchiques (Lustre) : pool, tier, policy engine,
- systèmes clé-valeurs et NoSQL (Redis, MongoDB) : sharding, réplication, persistance,
- stockage objet (S3, Swift, Scalify, OpenIO, Phobos) : consistent hashing, multi-level distributed tree.

Learning objectives

Afin de garantir des niveaux élevés de fiabilité et de performance, les systèmes informatiques déployés au sein des centres de calcul, de stockage et de traitement des données, sont massivement distribués. Nous étudierons au sein de ce cours les principaux défis techniques relevés par ces solutions communément utilisées au sein des datacenters d'aujourd'hui et de demain.

Overall organisation

Pour chacune des thématiques, à partir des principales solutions open-source disponibles que nous déployerons pour les prendre en main, nous mettrons en évidence les

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Cloud computing	2.5	Semestre 1	18					
■								

Cloud computing

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Practice of a programming language like Java or C++ - basic knowledge of operating systems - basic knowledge of computer networks - basic knowledge of relational database management systems.

Programme/contents

- General Introduction
- Virtualization and cloud
- Cloud storage at the file-level
- Cloud storage at the database level
- Security in the cloud
- Programming models for the cloud
- Optimal allocation of resources in the cloud.

Learning objectives

The objectives of the cloud computing course are to enable the students to gain a deep understanding of the software implementation concepts of a cloud so that they can be users, expert developers, but also administrators or contributors for such infrastructures. Accordingly, the course will address the major features of current cloud systems, namely virtualization (at the storage, computing, and networking levels), storage (file system level but also data management system), security, elasticity, programming models, and optimal allocation of resources. The concepts are presented based on the state of the art of the domain and on what is used in the cloud computing market (like AWS, Google App Engine, or MS Azure).

Type of assessment

Evaluation Continue non Intégrale

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Qualité de service dans les réseaux	2.5	Semestre 1	18					
■								

Qualité de service dans les réseaux

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Basis of Computer Networks.

Learning objectives

The first objective of this course is to introduce the different concepts related to the performance of systems and networks. In particular, the definition of Quality of Service (QoS), SLA (Service Level Agreement), and SLS (Service Level Specification), and how they relate to the functioning of the delivered services. The second objective is to introduce the different analytical methods to model these networks and systems and evaluate the expected Quality of Service under different hypotheses.

Overall organisation

Tutorials, practical examples, and research papers.

Final Exam.

Bibliography

- Qualité de Service dans les Réseaux Hauts Débits
Prof. Tülin ATMACA, Institut Mines
Télécom/Télécom SudParis.
- Performance Evaluation of Computer and
Communication Systems 1st Edition by Jean-Yves
Le Boudec.
- Bruno Baynat et al., Théorie des files d'attente «des
chaînes de Markov aux réseaux à formes produit»,
Hermès, juin 2000.

Type of assessment

Evaluation Continue non Intégrale

Apprentissage profond	2.5	Semestre 1	18
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Apprentissage profond

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Prerequisites

Bases d'apprentissage automatique

Programme/contents

L'apprentissage profond (deep learning) constitue aujourd'hui une composante essentielle de l'intelligence artificielle (IA).

Il s'agit d'un ensemble de méthodes permettant de modéliser des données complexes à un haut niveau d'abstraction,

à l'aide de réseaux de neurones artificiels composés de multiples couches.

Ces approches ont permis des progrès spectaculaires dans des domaines variés tels que :

- la vision par ordinateur (reconnaissance d'images, détection d'objets, vision autonome),
- le traitement automatique du langage naturel (traduction, génération de texte, modèles comme ChatGPT ou DeepSeek),
- la reconnaissance vocale et sonore,
- ou encore la génération de contenu multimédia (images, musique, vidéos).

Programme du cours

Introduction à l'apprentissage profond:

- Motivation et émergence du deep learning
- Réseaux de neurones artificiels (ANN)
- Neurone artificiel, fonctions d'activation
- Propagation avant et rétropropagation du gradient
- Optimisation et régularisation

Réseaux de neurones convolutifs (CNN)

- Convolutions, pooling, architectures classiques (LeNet, AlexNet, ResNet)
- Applications à la vision par ordinateur

Modèles génératifs

- Auto-encodeurs et variantes (variational auto-encoders,

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	direct study/pr class
Reinforcement learning and approximation algorithms	2.5	Semestre 1	18					

Reinforcement learning and approximation algorithms

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Connaissance du langage Python, notion de probabilités.

Programme/contents

Introduction à l'apprentissage par renforcement

- Qu'est-ce que le RL ?
- Processus de décision markoviens (MDP)
- Concepts de programmation dynamique
- Évaluation et amélioration de politiques
- Itération de politique
- Itération de valeur

Méthodes tabulées

- Méthodes Monte Carlo
- Apprentissage par différence temporelle (TD)

Approximation de fonctions

- Approximation linéaire
- Méthodes de descente de gradient
- Méthodes de gradient de politique
- Algorithme REINFORCE et techniques de réduction de la variance

Learning objectives

La partie RL du cours fournit une introduction approfondie à l'apprentissage par renforcement (RL), en mettant l'accent sur les algorithmes fondamentaux et les applications pratiques. Les étudiants aborderont les principes de la prise de décision séquentielle, les bases des processus de décision markoviens, les fonctions de valeur, et l'optimisation de politique.

Dans toutes les séances, les étudiants auront à expérimenter les algorithmes et approches étudiés en instanciant des agents Python apprenant sur des

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Multicriteria optimization	2.5	Semestre 1	18					

Multicriteria optimization

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Programme/contents

Different ways to approach a multi-objective optimization problem (objective aggregation, constrained optimization, the ideal point approach, the Pareto set, etc.).

Construction of approximate Pareto fronts with performance guarantees for several combinatorial optimization problems (in particular shortest path problems and scheduling problems with energy minimization).

Multi-objective dynamic programming.

Multi-objective gradient descent methods for continuous optimization and machine learning.

Bibliography

Multicriteria Optimization, M. Ehrgott, Springer 2005

Type of assessment

Evaluation Terminale

[PROG1.1 : PREUVE FORMELLE MÉCANISÉE \(OUVERT AUX ÉTUDIANTS DE L'ENSIIE EN BICURSUS\)](#)

2.5 Semestre 1 18

PROG1.1 : PREUVE FORMELLE MÉCANISÉE (OUVERT AUX ÉTUDIANTS DE L'ENSIIE EN BICURSUS)

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Type of assessment

Détail renseigné au niveau Élément Constitutif

[PROG1.2 :](#)

[SÉMANTIQUE DES](#)

[LANGAGES DE](#)

[PROGRAMMATION](#)

[\(OUVERT AUX](#)

[ÉTUDIANTS DE](#)

[L'ENSIIE EN](#)

[BICURSUS\)](#)

2.5

Semestre

1

18

PROG1.2 : SÉMANTIQUE DES LANGAGES DE PROGRAMMATION (OUVERT AUX ÉTUDIANTS DE L'ENSIIE EN BICURSUS)

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Type of assessment

Détail renseigné au niveau Élément Constitutif

Spécification, modélisation, vérification, et ouverture

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Computational DNA Nanotechnology	2.5	Semestre 1	18					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
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Computational DNA Nanotechnology

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

1. **basics of computer science (complexity, automata theory, langage theory)**
2. **basics of the biology of DNA**

Programme/contents

1. **Presentation of DNA self-assembly, theory and experiments.**
2. **Biomedical applications of DNA self-assembly : reading and discussion.**
3. **Supervised project on the design of a DNA origami.**

Learning objectives

1. **Understand the basic principles of DNA self-assembly and DNA computing.**
2. **Understand basic applications of DNA nanotechnology in biology and medicine.**
3. **Learn how to design basic DNA nanostructures.**

Overall organisation

This class starts by a brief presentation of the computational aspects of DNA self-assembly and the experimental technique of DNA origami. This presentation is followed by a reading session in which the students are encouraged to present their favorite aspects in detail to their peers. The class ends with a practical assignment in the DNA origami design software <https://www.ens-lyon.fr/ensnano/>, in which the students are encouraged to design a shape having a high probability of folding in a test tube.

Bibliography

1. Fan Hong, Fei Zhang, Yan Liu, Hao Yan: DNA Origami: Scaffolds for Creating Higher Order

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Concurrent and timed processes	2.5	Semestre 1	18					
■								

Concurrent and timed processes

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Basic knowledge of formal languages and automata theory.

Programme/contents

The objectives of the course are to understand the fundamentals of concurrent systems, to be able to model and rigorously compare these systems, to be able to check functional correction properties of these systems.

Contents:

Two families of models will be discussed:

- Discrete models (finite automata, Petri nets), interleaving vs. "true concurrence", validation of mutual exclusion properties, absence of deadlock, equity, bounded-ness ...
- Their timed extensions (timed automata, timed Petri nets), model-checking, symbolic approaches, limitations, tools (UPPAAL, TINA).

Type of assessment

Evaluation Terminale

[Approches](#)

[formelles pour la vérification de programmes](#)

2.5 Semestre 1 18

Approches formelles pour la vérification de programmes

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Prerequisites

Cours de logique de base : logique propositionnelle, logique du premier ordre, sémantique.

- Pratique d'un langage de programmation.

- Cours de Théorie des Langages : automates, grammaires hors-contextes.

Programme/contents

Les méthodes formelles permettent de garantir la sûreté d'un système par rapport à une spécification donnée. Dans ce cours, on étudiera principalement les approches basées sur la preuve, qui requièrent des spécifications très expressives. Après un rappel sur la logique du premier ordre, seront présentées les principales méthodes pour faire des preuves assistées par ordinateur : d'une part des outils complètement automatiques comme les solveurs Satisfiabilité Modulo Théorie et les prouveurs automatiques pour la logique du premier ordre ; d'autre part les assistants à la démonstration qui sont plus puissants mais nécessitent l'intervention de l'utilisateur.

Il sera également étudié comment ajouter des spécifications à un programme, sous la forme d'annotations et/ou de contrats. Pour vérifier ces annotations, par le biais de la logique de Hoare, les annotations sont transformées en obligations de preuve dont la démonstration garantit le respect de la spécification avant même toute exécution. Le cours comporte également une initiation à la manipulation du plugin WP de la plateforme d'analyse des programmes C appelée Frama-C.

La dernière partie du cours vise à présenter les

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Systèmes multi-agents	2.5	Semestre 1	18					
■								

Systèmes multi-agents

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Programme/contents

L'objectif du cours est d'aborder les outils fondamentaux d'analyse et de modélisation des systèmes complexes et d'en étudier l'application sur des problématiques de systèmes informatiques autogérés. Les outils transversaux de la complexité trouvent dans cette perspective un nouveau champ applicatif à explorer.

Contenu :

Introduction aux outils théoriques relatifs à la dynamique des systèmes complexes résultant de l'interaction de multiples agents concurrents, souvent configurés en réseau.

Présentation de différents modèles permettant la conception et la régulation dynamique de systèmes décentralisés fondés sur les principes d'auto-organisation et d'émergence, et, dans ce cadre, présentation des mécanismes principaux de l'intelligence collective et d'un ensemble d'exemples d'application (auto-assemblage, routage adaptatif, optimisation, etc.).

Type of assessment

Evaluation Continue non Intégrale

[Modélisation et analyse formelles](#)

2.5 Semestre 1 18

Modélisation et analyse formelles

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Prerequisites

Connaissances générales en informatique de niveau master.

Programme/contents

Ce cours présente des outils et méthodes pour modéliser et analyser des socio-écosystèmes à l'aide de méthodes formelles. L'objectif est de comprendre le fonctionnement de ces systèmes pour faire face aux changements rapides qu'ils subissent actuellement (dérèglement climatique, effondrement de la biodiversité, etc.) et prendre des mesures de gestion visant à les maintenir sur certaines trajectoires. Les méthodes mises en œuvre (réseaux de Petri, model-checking, calcul symbolique, etc.) sont classiques en informatique, mais elles sont ici utilisées de manière originale compte tenu du contexte particulier.

Bibliography

<https://ecco.ibisc.univ-evry.fr/papers.html#pnse-fp-2022>

<https://ecco.ibisc.univ-evry.fr/papers.html#plos-2022>

<https://ecco.ibisc.univ-evry.fr/papers.html#mee-2019>

Type of assessment

Evaluation Terminale

Game Theory	2.5	Semestre 1	18
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Subjects	ECTS Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
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Game Theory

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Standard knowledge in algorithmics.

Programme/contents

Game theory is used to investigate the fundamental mechanism underpinning the decision making. This theoretical framework is used in computer science to study the complexity of self-star systems. The objective of this course is to introduce the techniques and concepts from non-cooperative and cooperative games to provide algorithms for entities to cooperate, self-organize and respond to changes in their environment while optimizing a certain objective function. At the end of the UE, the student will be able to solve algorithmic and specification problems based on game theory. The main parts of this course addresses:

- a.Introduction to game theory
- b.Strategic game theory
- c.Algorithmic based game theory
- d.Nash equilibria computation
- e.Parity game theory
- f.Price of anarchy and price of stability
- g.Mechanism design (VCG mechanism) and truthful algorithms.
- h.Application to concrete cases including scheduling, routing and decision-making problems.

Bibliography

Algorithmic Game Theory, N. Nissam, T. Roughgarden, E. Tardos, V. Vazirani, Cambridge University Press, 2007.

Type of assessment

Evaluation Terminale

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
UE Libre	2.5	Semestre 1	18					
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UE Libre

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Type of assessment

Détail renseigné au niveau Élément Constitutif

[PROG2.1 :](#)

[ANALYSE](#)

[STATIQUE DE](#)

[PROGRAMMES](#)

[\(OUVERT AUX](#)

[ÉTUDIANTS](#)

[DE L'ENSIIE](#)

[EN BICURSUS\)](#)

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PROG2.1 : ANALYSE STATIQUE DE PROGRAMMES (OUVERT AUX ÉTUDIANTS DE L'ENSIIE EN BICURSUS)

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Type of assessment

Détail renseigné au niveau Élément Constitutif

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
PROG2.2 : PROJET VÉRIFICATION DE PROGRAMMES (OUVERT AUX ÉTUDIANTS DE L'ENSIIE EN BICURSUS)	2.5	Semestre 1	18					
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PROG2.2 : PROJET VÉRIFICATION DE PROGRAMMES (OUVERT AUX ÉTUDIANTS DE L'ENSIIE EN BICURSUS)

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 18

Language(s) of instruction

Français

Remote teaching

non

Type of assessment

Détail renseigné au niveau Élément Constitutif

[Introduction à
l'entrepreneuriat
: Créer sa start-
up Deeptech](#)

2.5 Semestre 1 20

Introduction à l'entrepreneuriat : Créer sa start-up Deeptech

ECTS : 2.5

Semester: Semestre 1

Detail

Lecture: 20

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

No prerequisites. However, this course is intended for students who are potentially interested in entrepreneurship (without the requirement of having an entrepreneurial project) or who wish to explore whether becoming an entrepreneur would suit them.

Programme/contents

The course will address the key components of a deeptech entrepreneurial project, detailing each essential step in the process of starting a company:

- **Introduction:** myths and realities of entrepreneurship, the entrepreneur's profile, and the specific features of deeptech entrepreneurship.
Presentation of **Genopole** and the **Shaker** startup support program.
- **Proof of Concept (POC)**
- **Market study**
- **Business plan**
- **Sources of funding**
- **Legal and administrative aspects**
- **Human resources, co-founder search, management**
- **Intellectual property**
- **From research to valorization: bridging the gap**
- **Marketing / communication**
- **Business development, partnerships with large corporations**

Learning objectives

Provide students with a biotech entrepreneurship toolkit:

- Offer clear, comprehensive, and concrete information about the business of start-ups

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	practical class	directed study/practical class
Stage recherche et développement et mémoire professionnel ou de recherche	30	Semestre 2						
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Stage recherche et développement et mémoire professionnel ou de recherche

ECTS : 30

Semester: Semestre 2

Language(s) of instruction

Anglais

Remote teaching

non

Type of assessment

Evaluation Continue non Intégrale

Teaching Location(s)

EVRY

Contact

- **Eric ANGEL**

<http://www.universite-paris-saclay.fr/formation/master/informatique/m2-computer-and-network-systems-cns-systemes-autonomiques-sa>