

# Advances in Learning and Decision Making: At the Interface between Neuroscience, Psychology, Machine Learning and Robotics

## Overview

Understanding and developing autonomous agents based on Learning and Decision Making cognitive processes has been important fields of cognitive science. The aim of this course is to introduce the multi-disciplinary approaches and methodologies for the investigation of learning & decision Making. The multi-disciplinary approaches include ideas from psychology, neuroscience and artificial intelligence/machine learning. The methodologies include computational, neurobiological and cognitive robotics. The objective of the course is to introduce both these aspects while taking learning and decision-making as cognitive processes of interest. A secondary goal of the course is to illustrate how interdisciplinary and exchanges of knowledge, methods and points of views on a common object of interest (learning & decision-making) enables cross-fertilization between neuroscience, psychology, machine learning and robotics.

<b>Modules</b>	<b>Course Duration (February 11-22, 2019)</b> <b>Module 1: Introduction to an Interdisciplinary Field of Studies (3 Lectures)</b> <b>Module 2: Computational models of Machine Learning (5 Lectures)</b> <b>Module 3: Value-based decision-making in Neuro &amp; Psychology (3 Lectures)</b> <b>Module 4: Ethical and societal questions (3 Lectures)</b> <b>Module 5: Interfaces, Integration and Future Challenges (3 Lectures)</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>▪ You are a graduate student in cognitive science, cognitive psychology, or neuroscience interested in extending your knowledge in this area.</li><li>▪ You have an interest in learning and decision making in your studies in other related areas such as computer science or other engineering disciplines</li><li>▪ You have a professional interest in situations where the study of learning and decision making is of practical importance.</li></ul>
<b>Fees</b>	The participation fees for taking the course is as follows: Participants from abroad: US \$200 Industry/ Research Organizations: Rs. 15000 Academic Institutions (Faculty): Rs. 8000 Academic Institutions (Students): Rs. 5000 The above fee includes all instructional materials, computer use for tutorials and assignments, and laboratory equipment usage charges. The fee does not include accommodation or food costs.

## The Faculty



Dr. Mehdi Khamassi is a permanent research scientist at the French National Center for Scientific Research (CNRS), working at the Institute of Intelligent Systems and Robotics (ISIR), Sorbonne

Université, Paris, France. He is also a visiting researcher in the Intelligent Robotics and Automation Laboratory of the National Technical University of Athens, Greece, and in the Department of Experimental Psychology at the University of Oxford, UK. He has a Master degree in Electrical and Computer Engineering (2003) from Conservatoire National des Arts et Métiers, Paris, France, and a Master degree in Cognitive Sciences (2003), a Ph.D. in Cognitive Neuroscience (2007) and a Habilitation to Direct Researches (2014) from Université Pierre et Marie Curie, Paris, France. He currently serves as director of studies for the Cogmaster program at Ecole Normale Supérieure / Ecole des Hautes Etudes en Sciences Sociales / Université Paris Descartes, Paris, France, and as associate editor for the journals *Frontiers in Neurobotics* and *Intellectica*. His main research interests include decision-making, reinforcement learning, performance monitoring, and reward signals during social and non-social paradigms.



Prof. Narayanan Srinivasan is currently Professor and Head at the Centre of Behavioural and Cognitive Sciences (CBCS), University of Allahabad. He has a Master degree in Electrical Engineering from Indian Institute

of Science and PhD in Psychology from University of Georgia. He has been working at CBCS for the past twelve years. He is interested in understanding mental processes especially perception, attention, emotions, and decision making. He has more than hundred and forty publications. He has worked on the effects of attention on perception, emotions, and decision making. Dr. Srinivasan is a fellow of Association for Psychological Science.

## Course Co-ordinator

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## Local Coordinator, GIAN

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