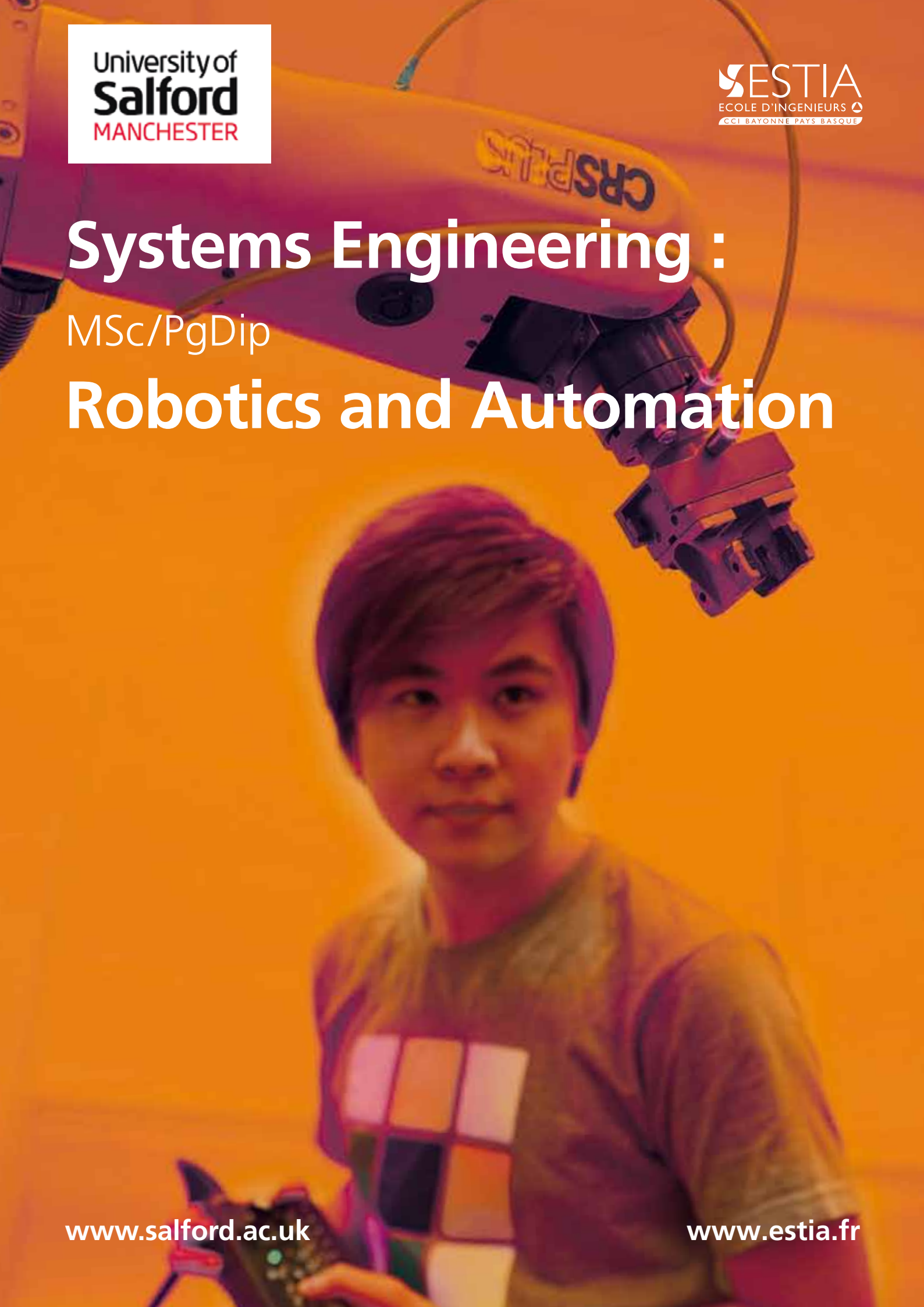
University of Salford MANCHESTER

ESTIA ECOLE D'INGENIEURS CCI BAYONNE PAYS BASQUE

Systems Engineering :

MSc/PgDip

Robotics and Automation



www.salford.ac.uk

www.estia.fr

This Postgraduate programme is for students who already have an Engineering, Computer Science or Bio-engineering, and Mechanical background and wish to specialise in Systems engineering, Robotics and Automation.
With a particular emphasis on Advanced Robotics, the learning will focus on systems that are designed to operate with a degree of intelligence and autonomy.

After spending 4 weeks in Salford (G.B.), the students will stay in Biarritz (French bask seaside), taught by the Salford lecturers, by Estia lecturers, and by Industrial experts.
The MSc Robotics and Automation will give you a firm grounding in control engineering and intelligent systems concepts, along with the ability to comprehend and fully specify integrated Automation Systems embodies intelligence, Robotic and Automation hardware and software, and virtual reality (VR)/simulation technologies. This qualification also provides a suitable background for research in advanced autonomous systems with reference to robotics.

Systems Engineering

Systems engineering is an interdisciplinary field of engineering that focuses on how complex engineering projects should be designed and managed over the life cycle of the project. Issues such as automatic control of machinery, logistics, and the coordination of different teams become more difficult when dealing with large, complex projects. Systems engineering deals with work-processes and tools to manage risks on such projects, and it overlaps with both technical and human-centered disciplines such as control engineering, industrial engineering and project management.

Modules

Automation and Robotics

This module develops a detailed and systematic understanding of the principles of automation and its application to industrial plant. You will also learn how to formulate and solve the kinematics and dynamics of manipulators. In addition, the module develops a comprehensive knowledge about agile and lean manufacturing and how these techniques together can improve productivity At the end of the module you will have a deep understanding of PLC/SCADA based control systems; be able to programme a range of industrial robots and understand the operational management of manufacturing systems.

Interactive Visualisation

This module aims to give you an understanding of a representative cross section of the science and technology necessary to use, design, develop and critically evaluate Interactive Visual (Virtual Reality) systems. This includes analysing novel Virtual Reality applications to formulate functional and non-functional specifications, understanding of the principles of real-time 3D computer graphics and their enaction using low level APIs and high level toolkits and developing virtual reality solutions through integration of standard components.

Artificial Intelligence

Explore the role of Artificial Intelligence in engineering applications.
The module develops both theoretical understanding and practical experience of using Knowledge Based Systems, Fuzzy Logic, Artificial Neural Networks, Evolutionary Computing and Swarm Intelligence in a broad range of Engineering applications. You will gain experience at applying AI techniques to a broad range of industrial problems including diagnostics, control. robotics, scheduling, planning and optimisation.

Mobile Robotics

Autonomous intelligent systems are at the forefront of todays technology. This module will give you an understanding of the underlying principles of mobile systems, a practical knowledge of its applications, and an ability to to analyse and solve related real-world autonomous systems problems. With this knowledge you will be able to critically review and analyse current autonomous systems by having the opportunity to programme and deploy a range of industrial standard mobile robotic/software platforms.

MSc Project

You will work under the direction of an academic supervisor to carry out an advanced research or development project related to Robotics, Automation and/or Systems Engineering. As part of this project you will be expected to:
- Plan, manage and implement a project related to Robotics and/or Automation and Systems Engineering
- Utilise appropriate sources of information to carry out and produce a literature review
- Develop a framework for critical assessment and evaluation
- Organise and produce an MSc Dissertation.

It may be carried out everywhere in the world, specially in conjunction with scientific platforms or companies associated with the University of Salford or with Estia.

Teaching and assessment

Teaching is by a series of lectures and workshops with many modules taught via extensive hands-on practical lab-based design and implementation of lecture material. Practical experience includes the use of robotics platforms to produce a software system using the MATLAB toolboxes or the C programming language or to produce a finished hardware/software based mobile robotics system.

Facilities

There are dedicated labs and facilities for Robotics and Automation students, including: Industrial robots (FlexPicker, Kuka, Nachi, Adept, CRS), humanoid robots (Nao), various mobile Robots, stereovision cameras, industrial cameras, plus dedicated computing facilities.
If you carry out your MSc Project with an aerospace company, as many of our students do, then you will also have access to their facilities.

Job Prospects

Graduates can expect to find employment in a range of industries. Robotics and Automation presents many career opportunities in areas such as control systems design and integration, manufacturing automation, robotic design, software engineering, mechanical and mechatronic engineering, process control, engineering management and research. Our graduates have gone on to successful careers with organizations such as Airbus, Thales, Dassault Systems, Dassault Avation, RATP and Siemens, BAE Systems, Electro Impact.

Graduate profiles

Michel HARISPURU

Responsable du pôle robotique (Dassault Aviation) “Après 2 ans en tant que pilote robotique chez VINCI, j’ai été recruté par Dassault Aviation à Biarritz, ceci en tant qu’ingénieur roboticien.
Je suis aujourd’hui Responsable du pôle robotique pour l’ensemble de l’unité d’assemblage. L’alliance entre un enseignement généraliste et de nombreux projets réalisés en groupe à l’ESTIA m’a bien préparé à assumer les responsabilités techniques et managériales de ce métier.”

Laurent TEYSSIE

ESTIA, Industrial Development Manager Intertechnique (Zodiac Aerospace)

“I conducted my final year MSc Dissertation project at the University of Salford on the use of industrial robots for electrical engine design for a company called Leroy Somer, part of the Emerson Group. Afterwards I was appointed by them as an Industrial Engineer to manage a project in TPM/ Lean Manufacturing for increasing the productivity using real-time process control. After this experience I was appointed by Intertechnique as an Industrial Manager and am currently responsible for the industrial development of equipment from the design phase to the production phase.”

Staff profile

Prof Samia NEFTI-MEZIANI (Salford)

“Prof Samia Nefti-Meziani is the Head of the Autonomous Systems and Robotics Research Centre. She is a leading expert in Artificial Intelligence and Robotics. Her research interests are concerned with the development of cognitive models for information processing, decision support systems and robotics. She has published and edited extensively in the above areas in leading academic journals and leads an expert team of researchers producing work that is recognised internationally.”
She is the Director and the programme leader of the Robotics curriculums.

Dr Olivier PATROUIX (Estia)

“Dr Olivier PATROUIX, a teacher and researcher in robotics and image processing, is the academic referent for this program in Estia, while several Estia teachers and researchers and involved to complete the Systems Engineering point of view.”

The MSc Robotics and Automation is closely aligned with the research carried out in our Centre for Advanced Robotics Research. The Centre houses a multidisciplinary group lead by Prof. Samia NEFTI-MEZIANI with interests in Artificial Cognitive Systems and Robotics and their constituent technologies. The group has strong National and International links with both industry and other research institutes.

The Centre's activities have their origin in 1987 when Salford University was chosen as the site of the United Kingdom's National Advanced Robotics Research Centre. Since then Robotics has formed a major strategic direction within Engineering in the University of Salford where Researchers have been at the forefront of strategic national developments initiated by the Department of Trade and Industry (DTI), the Department for Environment, Food and Rural Affairs (DEFRA) and the Engineering and Physical Sciences Research Council (EPSRC) and international developments within the E.U.

ESTIA is well known Academic French Institute in UK. They have been in Partnership with the University of Salford for nearly a decade. ESTIA has a very strong partnership with the industry (primes and SMEs). They has been chosen as a site to host the technical Centre «Compositadour» for Research, Knowledge transfer, and training in the aread of Robotics, Composites products design and manufacturing. www.estia.fr

Entry requirements:
A minimum of a 2:2 honours degree in engineering or science.
The French equivalent is : a minimum of Master-part1 validated ; post of the applicants got a Master degree, before, or a French or Spanish "titre d'ingénieur / titulo de ingeniero.

Estia has been in partnership with the University of Salford for seven years. If you are currently studying an engineering subject at Estia you will be able to complete this MSc as part of your final year of study. Please enquire for further information.

For information about the University of Salford visit www.salford.ac.uk about Estia visit www.estia.fr or www.compositadour.estia.fr

Enquiries

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