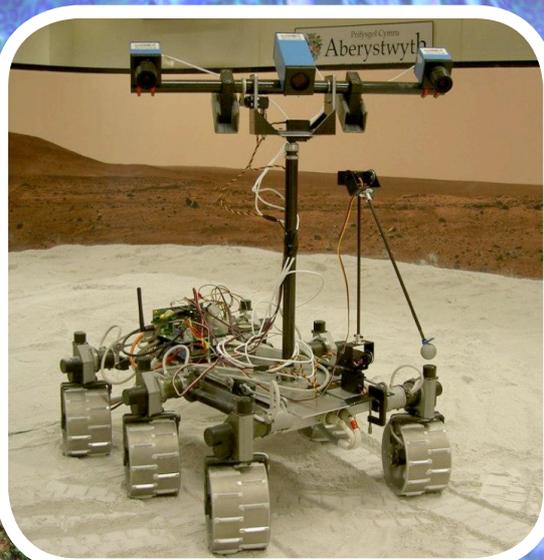


MSc in Intelligent Autonomous Systems

Department of Computer Science, Aberystwyth University

This Masters degree will give you a broad experience of Applied Artificial Intelligence along with excellent training for further research. You will be able to apply the knowledge you gain to the field of intelligent autonomous systems, which ranges from controlling mobile robots, to diagnosing problems on spacecraft, to intelligent information gathering web-based software robots.

Your degree will be industrially relevant, but will also provide you with an excellent research preparation for studying a PhD in any area of Intelligent Autonomous Systems.

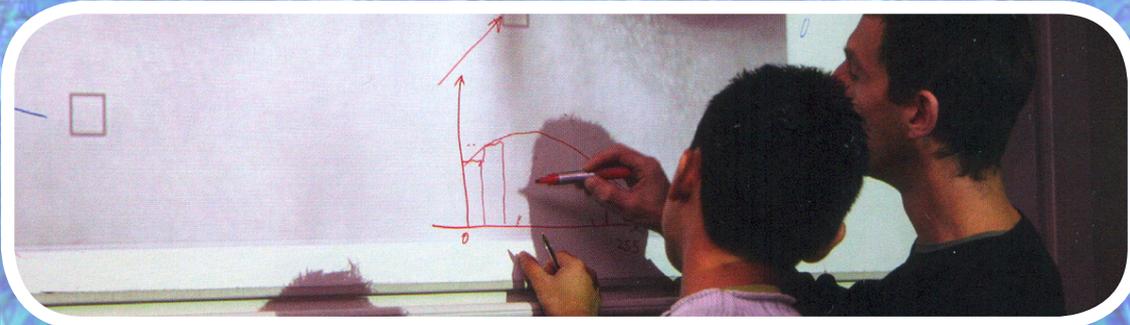


Why study Intelligent Autonomous Systems?

Computer technology is already being built into every aspect of our daily lives; we no longer simply use “computers” but are beginning to use “intelligent appliances” of all kinds. More and more these look after our homes, help us with our work and play and are generally seen as useful and clever tools. Already the best selling robot is no longer found in a car production plant but is a domestic floor cleaner, with over 3 million sold!

Such devices contain computing systems that need to be very advanced and able to communicate with one another and the internet. As they become more complex and interactive they need to become increasingly **autonomous** - able to cope with changing conditions in order to adapt to the individual needs of their users and to the circumstances of their local environments. At the same time they will need to become increasingly **intelligent** - able to make their own decisions and learn from their own experiences.

Central characteristics of autonomous systems are their abilities to sense, to understand and to act upon the environment in which they operate. Future intelligent autonomous systems will be created and developed by a large community of scientists and software engineers who will become expert in a range of new and exciting technologies.



What modules will I be taught?

Introduction to Intelligent Systems

will ensure you have a good grounding in artificial intelligence theory and techniques.

Adaptive Behaviour from Natural Systems looks at artificial life, how adaptation works in nature and can be applied to artificial systems, and how intelligent systems can optimise their performance.

Machine Learning for Intelligent Autonomous Systems teaches you how systems can learn and improve performance, including probabilistic methods, parametric methods, non-parametric methods and approaches to ensemble learning and meta-learning.

Representation and Reasoning for Intelligent Systems addresses how to constrain systems to help them cope with uncertainty, to reason about the real world, and to cooperate.

Applications of Intelligent Autonomous Systems shows you how systems can achieve and maintain their goals over time, in the face of changing environmental factors. This will give you hands-on experience of developing autonomous systems, working in the Department's robotic laboratories.

Research Training and Methods is a practical module to ensure you have the research and study skills required to produce your dissertation.

How is the course structured?

This Masters course includes 120 credits of taught material and a 60 credit research project and dissertation. In your first semester you will study three technical modules and in your second semester you will study two more.

Across both semesters you will study a "Research Training and Methods" module which will give you the research background to carry out a major research project. Your learning on these modules is done through seminars and directed reading, along

with practical laboratory sessions where appropriate.

Modules are assessed mostly by practical coursework, with examinations on only a few modules.

You will be encouraged to identify an appropriate research project during the "Applications of Autonomous Systems" module, and will spend three months (June, July and August) pursuing the project (with the help of your supervisor) and writing it up as a dissertation by the end of August.

September 2009

Research Training and Methods

Introduction to Intelligent Systems

Adaptive Behaviour

Representation and Reasoning for Intelligent Systems

February 2010

Machine Learning for Autonomous Systems

Applications of Autonomous Systems

June-August 2010

Project Module and Dissertation

What sort of Research Project and Dissertation can I do?

As you progress through the course you will be encouraged to identify areas which would interest you and to explore the literature of those areas. By June you will be very well prepared to start your individual research project and will be assigned a member of staff as a supervisor who will help and advise you during your chosen research project.

Examples of typical MSc projects are:

- Implementation of a navigation strategy for a sailing robot
- A health monitoring system for diabetic patients
- Cooperating web spiders
- Diagnostic software for an unmanned aircraft
- Mobile robot follow-the-leader
- Autonomous science target identification and acquisition for planetary exploration
- Free-flying space robot control

Why study IAS in Aberystwyth?

The Department of Computer Science at Aberystwyth is the leading research Computing Department in Wales, and was ranked in the top 20 of the entire UK by the recent Research Assessment Exercise. It has a strong research focus on techniques and applications of intelligent systems and works with many major companies.

Our taught Masters degrees draw on this focus and link to the expertise and interests of the Department. They are designed to meet the needs of all students; those wanting a foundation for a career in research and those wanting to expand on their skills to accelerate their industrial careers.



How can I find out more?

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Department web site:
<http://www.aber.ac.uk/compsci>

