

Course Title	Artificial Intelligence in Video Games				
Course Code	AI640				
Course Type	Elective				
Level	Master's (2 nd cycle)				
Year / Semester	1 st Year/2 nd Semester or 2 nd Year/1 st Semester				
Teacher's Name	TBA				
ECTS	7	Lectures / week	Up to 6 Teleconferences	Laboratories / week	None
Course Purpose and Objectives	AI has been integral to the creation of video games, primarily to model non-player behaviour so that video games uphold the challenge and motivation to play. The goal of this course is to examine the various ways that AI can be used in video games, and provide students the understanding and ability to write code that can model non-playable character interactive behaviour.				
Learning Outcomes	<p>Upon successful completion of this course students should be able to:</p> <ul style="list-style-type: none"> • Discuss the basic ways of using AI in video games • Evaluate various methods of applying AI in video games • Analyze and write code to using various AI techniques to model player and non-player behavior • Write decision making code utilizing decision trees, state machines, fuzzy logic, production systems, and/or scripts • Discuss and apply machine learning algorithms to games 				
Prerequisites	AI600, AI605		Co-requisites	None	
Course Content	<p>Background</p> <p>History of Artificial Intelligence and Games; Why Games for Artificial Intelligence; Why Artificial Intelligence for Games; AI Methods;</p> <p>Methods:</p> <p>Ad-Hoc Behavior Authoring; Tree Search; Evolutionary Computation; Supervised Learning; Reinforcement learning; Unsupervised learning; Notable Hybrid Algorithms</p> <p>AI in Games:</p> <p>Using AI to Play Games; Game Design and AI Design Considerations; Which Games Can AI Play</p> <p>Content Through AI:</p> <p>Generating Content; Taxonomy; How Could We Generate Content?; What Could Be Generated? Evaluating Content Generators</p>				

	<p>Modelling Players with AI:</p> <p>Modeling Players; What Player Modeling Is and What It Is Not; Why Model Players?; A High-Level Taxonomy of Approaches; Model Inputs and Outputs; How Can We Model Players?; What Can We Model?</p> <p>Panoramic Views of Game AI</p> <p>How Game AI Areas Inform Each Other; Game AI Research; General Game AI; AI in Other Roles for Games; Ethical Considerations</p>						
Teaching Methodology	E-Learning						
Bibliography	<p>Yiannakakis, G. N. and Togelius, J. (Latest Edition). Artificial Intelligence and Games. Springer.</p> <p>Millington, I. (Latest Edition). AI for Games. CRC Press.</p>						
Assessment	<table border="1"> <tr> <td>Final Examination</td> <td>50%</td> </tr> <tr> <td>Assignments/On-going evaluation</td> <td>50%</td> </tr> <tr> <td></td> <td>100%</td> </tr> </table>	Final Examination	50%	Assignments/On-going evaluation	50%		100%
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Language	English						