Game Design and Production (Game) 2020-2022

Code: SCI3046

Extent: Long (60 credit) or compact (40 credits) major. Students taking a compact major take also a minor (20-25 cr). Students taking a long major may include an optional minor in their elective studies.

Responsible Professor: Perttu Hämäläinen

Appreviation: Game

School: School of Science

Objectives

The objective of the major is to educate programmer-designers* that understand both technology and the player’s point of view, and can thus 1) participate in overall game design and 2) take responsibility of the myriad design decisions that are not necessarily communicated in a design document and only arise during implementation.

The students will learn about game design, production, and technology using a project-oriented, hands-on with minds-on approach. The project courses emphasize interdisciplinary and collaborative work. The teacher network includes both game industry professionals and game scholars.

* You may also substitute “engineer” or “computer scientist” for “programmer”.

Learning Outcomes

- Deepening of technological expertise already built during Bachelor level studies (compulsory technical courses on computer graphics, machine learning, and artificial intelligence)
- Building a wide set of cross-disciplinary design, production, and teamworking skills (compulsory Department of Media courses, especially DOM-E5095 game project, during which multiple games are developed).
- Deeper understanding of each student’s specific areas of interest (large selection of elective courses that can be included in the personal study plan).

Structure and content

The Game Design and Production major is organized in collaboration with Media Lab Helsinki of Aalto ARTS, which has an M.A. in New Media “sibling major” with the same name. Computer and video games is a multidisciplinary field, and the M.Sc. and M.A. majors share a large portion of the courses. The obligatory courses differ, however, and the CCIS students should expect to work in a more technical role, e.g., when creating a joint thesis game with ARTS students. Multidisciplinarity is also emphasized by the high flexibility of elective studies, where one can include, e.g., 3D animation, interactive storytelling and interaction design in addition to computer science.

Students take the Major compulsory courses. In addition, they take Major optional courses. Listing of optional courses is not exhaustive. Additionally, students may choose courses from all Aalto schools according to the personal study plan. It is strongly suggested that students venture outside their comfort zone and do not, for example, take a course in web software development if they already possess the equivalent skills and knowledge.

Courses

Major compulsory courses

<table>
<thead>
<tr>
<th>CODE</th>
<th>NAME</th>
<th>CREDITS</th>
<th>PERIOD/YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-C3100</td>
<td>Computer Graphics</td>
<td>5</td>
<td>I-II</td>
</tr>
<tr>
<td>CS-E4710 *</td>
<td>Machine Learning: Supervised Methods</td>
<td>5</td>
<td>I-II</td>
</tr>
<tr>
<td>CS-E4800</td>
<td>Artificial Intelligence</td>
<td>5</td>
<td>III-IV</td>
</tr>
<tr>
<td>DOM-E5080</td>
<td>Game Design</td>
<td>5</td>
<td>I</td>
</tr>
<tr>
<td>DOM-E5083</td>
<td>Game Analysis</td>
<td>5</td>
<td>II</td>
</tr>
<tr>
<td>DOM-E5135</td>
<td>Game Project</td>
<td>5–15</td>
<td>I-V/1st year</td>
</tr>
</tbody>
</table>
*) Students with no previous knowledge in machine learning should take course CS-C3240 Machine Learning instead. The follow-up course can be included in elective studies.

**Recommended optional courses**

(Students may also suggest others as game design is a multidisciplinary field).

<table>
<thead>
<tr>
<th>CODE</th>
<th>NAME</th>
<th>CREDITS</th>
<th>PERIOD/YEAR</th>
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</thead>
<tbody>
<tr>
<td>DOM-E5134</td>
<td>Advanced Topics in Game Design</td>
<td>3–5</td>
<td>II</td>
</tr>
<tr>
<td>DOM-E5082</td>
<td>Playability Evaluation</td>
<td>3</td>
<td>I</td>
</tr>
<tr>
<td>DOM-E5138</td>
<td>Games Now!</td>
<td>3–5</td>
<td>I-V</td>
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<td></td>
<td><strong>NOTE! You’ll find 2021-2022 course in Sisu with a code DOM-E513801</strong></td>
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<tr>
<td>DOM-E5129</td>
<td>Intelligent Computational Media</td>
<td>3-5</td>
<td>IV</td>
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<tr>
<td>CS-E5120</td>
<td>Introduction to Digital Business and Venturing</td>
<td>3</td>
<td>I</td>
</tr>
<tr>
<td>DOM-E5038</td>
<td>Generative and Interactive Narratives</td>
<td>3</td>
<td>III-V</td>
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<td>DOM-E5066</td>
<td>Introduction to Sound Design and Music</td>
<td>1–5</td>
<td>I</td>
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<td>DOM-E5029</td>
<td>Introduction to 3D Animation</td>
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<td>summer</td>
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<td>CS-E4840</td>
<td>Information Visualization</td>
<td>5</td>
<td>IV-V</td>
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<tr>
<td>ELEC-E7851</td>
<td>Computational User Interface Design</td>
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<td>II</td>
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<tr>
<td>CS-E4200</td>
<td>Emergent User Interfaces</td>
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<td>III-V</td>
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<td>CS-C3120</td>
<td>Human-Computer Interaction</td>
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<td>I-II</td>
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<td>CS-E5520</td>
<td>Advanced Computer Graphics</td>
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<tr>
<td>CS-C3170</td>
<td>Web Software Development</td>
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<td>CS-C3130</td>
<td>Information Security</td>
<td>5</td>
<td>I/1st year</td>
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<tr>
<td>CS-E3190</td>
<td>Principles of Algorithmic Techniques</td>
<td>5</td>
<td>I-II/1st year</td>
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<td>CS-E4580</td>
<td>Programming Parallel Computers</td>
<td>5</td>
<td>V</td>
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<td>CS-E4830</td>
<td>Kernel Methods in Machine Learning</td>
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<td>CS-E4890</td>
<td>Deep Learning</td>
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<td>IV-V</td>
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<td>CS-E4820</td>
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<td>III-IV</td>
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<td>CS-E4850</td>
<td>Computer Vision</td>
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<td>I-II</td>
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<tr>
<td>CS-E4190</td>
<td>Cloud Software and Systems</td>
<td>5</td>
<td>I-II</td>
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