IntelliDev 3D
AI tool for making 3D-printable models

1. Introduction

The goal is to create AI software that automates the modeling process for 3D printing process. End users include 3D artists, game designers and rapid prototype engineers.

2. Project Goal

The end result is a working desktop application prototype. The tool automates menial parts of 3D-printable model creation.

There are 2 main software components:

1. Constraint logic supervision program with UI
2. Pattern matcher AI for inferring 3D models from metadata

Learning outcomes

During the project you will learn:

- Software development in a real environment, covering all stages of the project, and communication with stakeholders and end-users
- Different AI methods for problem-solving
- Agile Scrum practices
- Modern project management and Version control tools (Git, Azure DevOps)
- UX & UI design

To support your learning, the client representative Antti Halava is able to provide 150-200 hours of Product Owner and Domain expertise, especially in AI, algorithms & Scrum framework.

3. Technologies

Scala

python™

...or your choice

Software implementation can use any language suitable for AI frameworks. We think Python and Scala fit well, and we can provide technical assistance for these languages. We are open to other suggestions as well.

We provide the version control & project management system, for which we provide training during Sprint 0.

In this project you will focus on the software components. 3D printing & related hardware is handled by us with our resin printers. You will learn about the software side of 3D printing during the project.

In general, we provide all the development software & printing tools.

4. Requirements for students

The only “requirement” is interest in the field of AI and algorithms. Aalto courses in the CS-A114X series (Data Structures and Algorithms) are recommended but in no way mandatory!

We can handle the 3D printing and we provide training in the use of our project management system, so no prior knowledge needed.

Difficulty

Project base difficulty is moderate. This covers the constraint logic supervision program and its UI.

The difficulty can be scaled to demanding if the team wishes to tackle the challenging aspects of AI design & development. We will of course provide assistance like domain expertise.

Many features are adjustable, so the difficulty can be scaled even midway during the project.

Team language can be either Finnish or English.

5. Legal Issues

Client gets all IPRs to the results. Open sourcing (MIT license) is highly likely, but we will keep development private. Students get their own copy of the constraint logic supervisor program for personal use after completion.

Confidentiality: The client will share some confidential information.

6. Client

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ThreeDCrafter is a startup focusing on developing design tools. Our representative is Antti Halava, an automation programmer. His expertise is as follows:

- AI programming & design, data structures and algorithms
- Agile management (now 1-year-experience as certified Scrum Master)
- 3D printing with resin printers
- Azure DevOps & Azure Portal

Antti is able to work alongside the team as Product Owner. We have actual end-users & stakeholders present during later Sprint Reviews. We have no preselected student members.

We can provide meeting rooms for the big Sprint meetings. We are open to discuss any possible needs of the team. And if the COVID situation relaxes we are open to provide workspaces in Otaniemi.

We are super excited about AI and its applications, and we want to make this project your most memorable university course ever!