BRING THE AI CONTROLLED MODELBOT TO THE NEXT EVOLUTION!

Assignment

The Supermodels Modelbot is a GPT-3 based AI that assists our developers in maintaining oversight over their projects. It has read all kinds of documents, giving it the ability to answer advanced questions and provide insights that would have cost a human much longer to figure out.

With our sights set to the future, we want to expand the capabilities of the Modelbot. Currently, the modelbot interprets what you are asking right now and gives an appropriate response. Soon, we want it to consider the chat history in its answers. We want you to investigate how we are going to achieve this.

We have identified the following challenges:

- Investigate possibilities for incorporating chat history into Modelbot responses
- Create a proof of concept for chosen method

Internship overview

- Bachelor
- Intership / Graduation assignment
- Software
- Location: Eindhoven

Technologies

- C#
- AI
- GPT-3

SIOUX TECHNOLOGIES

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Context

Supermodels is our in-house model-driven development tool. We use it to model architectures & generate software directly from it. The Supermodels ecosystem contains several projects. The Holodeck project is our digital twin platform that allows us to create virtual representations of the machines we create. The Modelbot project is our GPT-3 based AI that assist developers maintaining oversight of their projects by being able to answer complex questions. All these elements are interconnected through the CloudPortal, allowing access to the various projects through the cloud.

Why choose Sioux?

- Working on innovative technology
- Challenging, dynamic and varied work
- A comfortable and personal work environment
- Plenty of opportunities for personal development
- Great carreer opportunities
- Contributing to a safe, healthy and sustainable society

Get in touch!
Would you like to know more about this student assignment?

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COOPERATIVE SWARM BOTS APPLICATION

Assignment

The assignment is to build a swarm bots application that Sioux can use as a demonstrator for commercial or recruitment events.

Some examples: form static symbols or dynamic patterns, logistic simulation, interact with objects. The system must be transportable and easy-to-use.

Available resources are:

- 20 Arduino bots with a Bluetooth module, battery powered, 2 stepper motors.
- Basic controller software in C/C++, build in an Arduino IDE.
- Basic client software to control the bots, written in Python, C# and Node.js/TypeScript.
- Vision software with QR tracking, written in Python using OpenCV.

Internship overview

- Bachelor / Master Student
- Graduation assignment
- ICT Software Engineering / Computer Science / Embedded Systems
- Location: Eindhoven

Technologies

- Swarm robotics
- Arduino IDE
- Bluetooth
- C, C++, Python, C#
- Node.js/TypeScript
- Wireless communication
- OpenCV
- QR tracking

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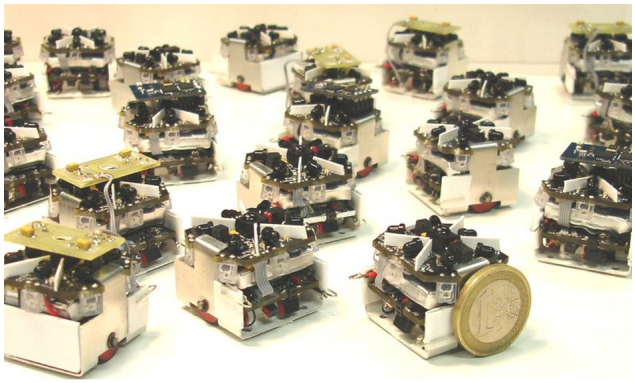
We have identified the following challenges:

- Reliable control of bots
- Determine location and direction
- Routing, collision detection and path finding
- Scalability aspects (e.g. is there a limit on the number of Bluetooth connections?)
- Task verification (did the bots fulfill the goal?)
- Exclude environmental conditions (e.g. calibration)
- Extend bots with autonomous behaviour



Context

The complexity of technological products is increasing every day. The interaction between software, electronics and mechanical systems is becoming more and more important.
The addition of functionality, scalability and margins is mainly achieved by developing complete functional modules, where all these disciplines are perfectly aligned.

Many of these aspects can been seen in swarm robotics, a coordination of multiple simple physical robots as one system. A desired collective behavior emerges from the interactions between the robots themselves and their environment.

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CREATE A VR CONTROL PANEL TO OPERATE THE HOLODECK AND THE DIGITAL TWIN!

Assignment

A digital twin is a virtual representation that serves as a real-time digital counterpart of a physical object or process. Within Sioux Technologies, we use digital twins to allow software engineers to test their software on virtual hardware in virtual reality early on in development. This greatly assists software engineers in their work by finding faults early on in development.

To control the digital twin, we want to use a VR control panel that allows control of the VR environment, but also the digital twin itself. We want you to create this VR control panel.

We have identified the following challenges:

- Design a UI for a VR control panel
- Implement the UI
- Implement possibility to interact with the VR environment
- Implement possibility to interact with the digital twin

Internship overview

- Bachelor
- Graduation assignment
- Software
- Location: Eindhoven

Technologies

- Unity
- Virtual Reality
- C#
- UX

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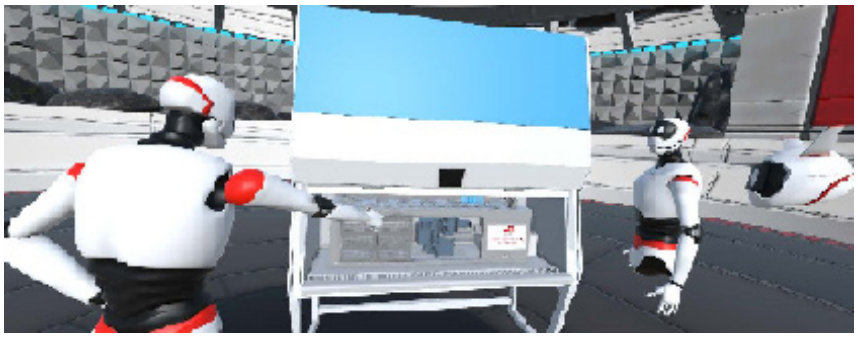
Context

Digital Twin Visualization is becoming increasingly popular in the industry. This is because it provides rapid visual feedback, allowing for fast error tracking which in the end results in a better product.

Within Sioux, we have created the Holodeck. Holodeck allows you to visualize and interact with your products. It is cloud-based, where one connects to the Holodeck environment. It's even possible to collaborate with multiple people, where multiple people connect to the cloud at the same time!

Holodeck is written in Unity. It is able to run scripts written in C#. It uses a library called Mirror to keep track of position, rotation and scale data for every user. Connection to the server is realized through GRPC.



Scene Holodeck

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UPGRADE THE CLOUD PORTAL TO THE NEXT LEVEL USING BLAZOR!

Assignment

The Supermodels Cloud Portal is a platform that interconnects various Supermodels related projects such as the Holodeck, our VR Digital Twin Platform, and the Modelbot, a GPT-3 based AI that assists developers keeping track of project data. In order to take the Supermodels ecosystem to the next level, we are looking to upgrade the cloud portal to the next evolution using Blazor.

We have identified the following challenges:

- Create a new version of the Cloud Portal using Blazor
- Integrate the Holodeck
- Integrate the Modelbot

Internship overview

- Bachelor / Master
- Intership / Graduation assignment
- Software
- Location: Eindhoven

Technologies

- Blazor
- C#
- Cloud

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