Master/Slave

INDA Proposal 2024

Joris Putteneers Deniz Güvendi

1 biography

1.1 Joris Putteneers

Joris Putteneers is an architect, software developer and researcher, interested in speculating the anthroposcene through means of software, hardware and media technologies. His work has been exhibited at MoMA New York, Londen Design Festival, Venice Biennale and multiple film festivals. He has taught internationally at the Bartlett UCL, Texas AM, KUL Faculty of Architecture and TU Wien.website.

1.2 Deniz Güvendi

Deniz Güvendi studied architecture in Istanbul, Krakow, and Ghent, holding an MSc.Architecture degree specializing in sustainable development from KU Leuven. She brings experience from diverse architecture projects, with a strong focus on adaptability, circularity, and nature-human-machine cooperation. behance.

Currently, Deniz and Joris are working on an IoT device that is used to inform architecture design decisions through analyzing and visualizing the hidden layers of the built environment.

2 Course Agenda

Keywords— #hacking #tracking #tracing #scraping #sensing #AI #synthetic #Iot #architecture #augmentation #compression #surveillance #stablediffusion #gaussiansplatting

In technology, architecture or electronics, the ”master/slave” protocol is used to describe an asymmetric relationship between primary and secondary devices or components of a system. This relationship is most often, dependent on the amount of control or computation embedded in a system. In a linked configuration, whenever a device has significantly more compute or control than its counterparts, it is considered to be the ’Master’, and if the roles are reversed, we call it a ’Slave’. A clear reference to this relationship used to be prominent within the AI-human discourse, but in recent years, this border has become more vague, cryptic and obscure. We are learning that machines can work better and faster, not when we subject them to our own modus operandi, but when we let them follow a different, nonhuman, black box protocol. We increasingly find it easier to let computers solve problems in their own way - even when we do not understand what they do or how they do it.
This workshop’s focus is on switching roles between ’Master’ and ’Slave’, letting go of control, embracing the unknown and speculating the simulacrum!

3 Methodology / Research Direction

We will exercise this exploration in the built environment in and around the university, taking sites from different scales and using them as subjects for our projects.

The project will unfold in 3 phases.

- **phase 1: Collecting-Sorting**
  Collecting, scraping, generating, and capturing data from the site is primarily accomplished through sensor data from encased microcontrollers. The result visualizes hidden layers of information, such as temperature, humidity, sound, WiFi, Bluetooth, and population as volumetric 3D heatmaps. Additionally, scraping tools, photogrammetry techniques, 360 videos, drone footage, metadata-mapped images, and synthetic data can also be employed. .

- **phase 2: Generating-Speculating**
  This 'homegrown' synthetic dataset will be used in three-dimensional stable diffusion models, generating, speculating, and hallucinating forms that critically act in response to corresponding inputs. The diffusion model is embedded with sensorial information and can now begin generating 'conditioned' models for different situations. The student is then able to analyze and map the 3D model through text prompts related to the input dataset, exploring its thresholds and boundaries.

- **phase 3: Augmenting-Making**
  Now, the 'conditioned' model can be augmented back on the physical site, seeing the relationship and unlocking the potential spatial opportunities. Various fabrication techniques can be used to build said physical models.

Students are expected to upload a progress model/image/screenshot/text every couple of hours to our visual archive as a means of capturing the amount of work that has been done.

4 Software / Skills

A combination of:

- various programming languages for programming a microcontroller, a database, a backend framework and our own stable diffusion model trained on our own in-house dataset.
- SideFX Houdini for visualizing the generated data and generating synthetic data.
- Git & GitHub for version control.
- Adobe Photoshop & Illustrator
- Blender & Rhinoceros for modelling.
- Gaussian Splatting for real-time rendering
- Various tools of fabrication. (3D printer, woodcutter, PVC tubes, etc.)

  All tools and techniques will have detailed documentation.