Oliver Sanhez

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About Me

I am a person driven purely by curiosity. So much so that during my Bachelor's degree I am finishing over 350 ECTS instead of the required 180. My interest is intelligent robotics and more specifically humanoid intelligent robotics. I have near 2 years of practical robotics experience and an entire year of research experience at PhD level within computer vision.

Selected Projects (this does not include my professional work or research)

Researching ML Techniques for Cone Detection from LiDAR Data for an Autonomous Race Car

Technologies: Python, C++, PyTorch, ROS2, Foxglove, Docker
Description:

- Built a pipeline for collecting (almost perfect) labeled data from LiDAR data using alternate detection pipeline.
- Learned and then implemented different types of classical ML and modern neural network architectures: FNN, CNN, GNN, SVM.
- Good results using neural networks instead of a power intensive detection pipeline!
- GitHub: click here

Investigating Mamba Architectures for Coronary Artery Segmentation

Technologies: Python, PyTorch
Description:

- **FIRST** to test brand new mamba architectures for 3d segmentation of coronary arteries.
- Quite promising results given the lack of excessive compute.
- My first in depth project in ML.
- GitHub: click here

Adapting DINO for Medical Tasks using LoRA

Technologies: Python, PyTorch
Description:

- Fine-tuned a huge foundational vision model (un-distrilled has 1B params)
- Showed that fine-tuning DINO on certain medical tasks can increase performance!
- **FIRST** to fine tune a Vision Foundation Model on ANY Medical Segmentation Tasks!
- GitHub: click here

Denoising Diffusion Probabilistic Models and Constrained Gaussian Processes

Technologies: Python, PyTorch, Pyro, R
Description:

- Did a deep dive into Denoising Diffusion Probabilistic Models (DDPMs) and SOTA alternative variations. All done on MNIST.
- Found out that Classifier Free Diffusion Guidance generates both the best visual images but also quantitatively
- I developed a novel quantitative way to measure generation quality by training a VAE on MNIST data and then comparing generated images with real images in the VAE's latent space.
- Explored fitting functions under integral constraints using Gaussian Processes
- GitHub: click here