Master internship subject
Garment-SAM: Segmenting garment images

Hosting institute

ICube Laboratory (The Engineering science, computer science and imaging laboratory) at the University of Strasbourg is a leading research center in Computer Science, with more than 300 permanent researchers, with the recently opened AI graduate school supported by the French government.

Work place and salary

The internship will take place in the MLMS (Machine Learning, Modeling & Simulation) research team of the ICube laboratory (The Engineering science, computer science and imaging laboratory) of the University of Strasbourg, a leading research center with more than 300 permanent researchers. The workplace is located on the hospital site of the laboratory, a 10-minute walk from the heart of downtown Strasbourg, listed as a UNESCO World Heritage Site.

650 euros net monthly

Supervisors

– director: Hyewon Seo (ICube, Univ. Strasbourg)

– co-supervisors: Cédric Bobenrieth (ICAM, Strasbourg)

Staring date

January 2025 – March 2025.

Description

Trained on a large-scale dataset, similar to other vision foundation models, Segment Anything Model (SAM) can generate fine-grained masks given manually defined visual prompts. Despite its remarkable success, however, it does not easily generalize to the segmentation of flexible objects like garments, since unlike the majority of objects, garments depict complex topological and geometric configurations, involving in particular strong self-occlusions or deformations.

In this internship, we aim to leverage promptable segmentation capability of SAM to the challenging problem of garment image segmentation. Our focus will be on developing a dedicated prompt tuning and learning strategy that generates optimal prompts for SAM, enabling accurate and efficient segmentation of garment images.

We will proceed with the following tasks:

1. **Testing of foundation models:** We will first test the performance of foundation models for segmentation. Among others, we will consider SAM (Segment Anything Model).

2. **Adaptation to garment images:** We will adapt the chosen foundation model to our downstream task, i.e. segmentation of garment images. A devoted prompt tuning/learning strategies will be developed,

eventually by basing on an available 3D dataset. A self-supervised loss will be integrated to exploit the domain specificity of the garment object.

3. **Experiements**: The segmentation performance will be evaluated by comparing the results to the groundtruth. The developed model as well as state-of-the-art methods will be evaluated to compare the performances. Additionally, a number of ablation studies will be conducted to assess the impact of various components on performance.

Candidate profile

− Master degree in Computer Science, Electronic & Electrical Engineering, or in Applied Mathematics

− Solid programming skills: Python/C++

− Background in Geometric Modeling

− Experience in Deep Learning

− Good communication skills

Application

Send your CV and academic records (Bachelor and Master) to seo@unistra.fr, for (a) possible interview(s).