

HAAG Weekly Report Week 1 & 2

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Time-Log

- What did you do this week?
 - Registered for CS 8903 course
 - Read research paper by Dr. Hirose on proposed point set registration method using Gaussian mixture Model and Statistical Shape Model.
 - Read research paper by Dr. Gatti
 - Signed up as Meeting Manager for 3D Modelling team.
 - Scheduled meetings with Dr. Porto and 3D Modelling team.
 - Discussed Project Proposal Steps with Teammates and action items.
- What are you going to do next week
 - Setup Repository for programming our replication of Dr. Hirose's method.
 - Decide on what dataset to use for our testing.
 - Attend first meeting with Dr. Porto.
- Blockers, things you want to flag, problems, etc.
 - We are still exploring what direction we want to take on for the project. As of now, we intend to replicate the methods proposed by Dr. Hirose, and we hope to extend that analyze the performance of the methods on moving objects.

Abstracts

Hirose, Osamu. "Dependent landmark drift: robust point set registration with a Gaussian mixture model and a statistical shape model." Kanazawa University, 2018.

<https://arxiv.org/pdf/1711.06588>

The goal of point set registration is to establish correspondences between two or more point-sets that represent the geometry of an object, which is crucial in fields like computer vision and medical imaging. The proposed method enhances traditional algorithms by integrating a Gaussian mixture model with a statistical shape model, allowing for robust registration even in the presence of outliers, missing data, or geometric transformations such as rotation. This approach not only improves registration accuracy by leveraging prior geometric knowledge but also achieves linear computational complexity, making it scalable

for large datasets, as demonstrated through empirical comparisons with existing methods on various human shape datasets.

What did you do and prove it

During the last two weeks I mainly worked on onboarding myself to the research project and getting myself familiar with the topic that I will be working on my reading some research papers. I also decided to act as a meeting manager for my team and thus scheduled a meeting with Dr. Porto and the rest of the team. In addition, I worked with some of my teammates on a project proposal and discussed the directions that we will be taking for our project in the coming weeks.

Links to papers read:

- <https://arxiv.org/pdf/1711.06588>
- <https://www.medrxiv.org/content/10.1101/2024.05.06.24306965v1>

Slack link for meeting setup discussion: <https://humanaugmente-e7j6563.slack.com/archives/C07358BJDEY/p1736882824040749>

Slack link for group project discussion: <https://humanaugmente-e7j6563.slack.com/archives/C088TS5716X/p1737090184943529>