

ECCS 504 Project Proposal

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Topic: Neural Tactile Transfer: Style Transfer between Soft Bubbles and Gelslim

Problem: Soft Bubbles and Gelslim sensors provide visuo-tactile feedback when in contact with an object, but they represent this information in different styles. Soft Bubbles offer a depth map of the deformation and the Gelslim provides an rgb image from an elastomeric tactile sensor. Current algorithms that use tactile feedback are usually trained on data from only one of these sensors, which makes it difficult to use the same algorithm when the other sensor is used.

Importance: Being able to generalize between different sensors will widen the application of the current algorithms that have been already trained with visuo-tactile data from either Soft Bubbles or Gelslim.

Methods: Collect similar tactile interactions for both sensors. Apply style transfer using Soft bubbles images or Gelslim images as content images, and use the other sensor image as style image. The goal is to be able to keep the same tactile information from either sensor but in the format of the other sensor.

Evaluation: Since we will collect similar tactile interaction with both sensors, we can evaluate the style transfer by comparing pixel by pixel the styled image with the ground truth image from the other sensor.

Note: This project will be used to investigate feasibility of the model as part of a research project in MMINT Lab with Professor [Nima Fazeli](#). [Samanta Rodriguez](#) is a PhD student in this lab and the main connection between this course project and the research lab. The lab can provide the sensor and the data.