

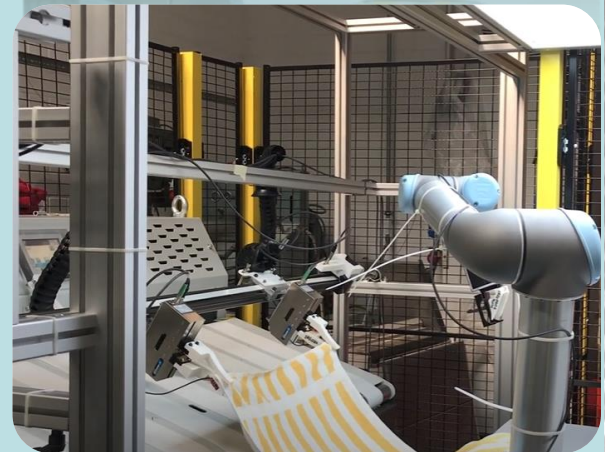
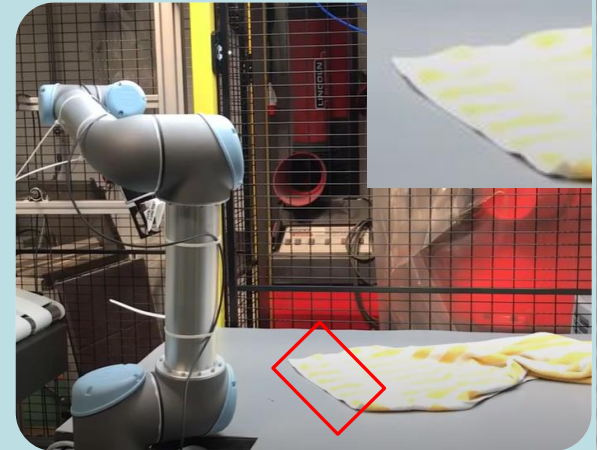
Bi-weekly Master's Thesis Update Meeting

Meeting #1 : 16/02/21

- Overview of the Thesis Topic
- Weekly Progress Review
- Next Steps

Thesis Proposal Overview

- **Problem**
- Primary task
- *Flattening a towel to feed to folding machine*
- Pipeline
 - Pre-manipulation – To obtain a flat seam
 - a) *Pick the towel*
 - b) *Place on top of a mechanical assembly*
 - Grasp point detection using computer vision pipeline
 - Feed to cartesian robot
 - Full flattening using cartesian robots
 - Feed to folding machine



Thesis Proposal Overview

■ Proposal

■ Pre-manipulation for grasping

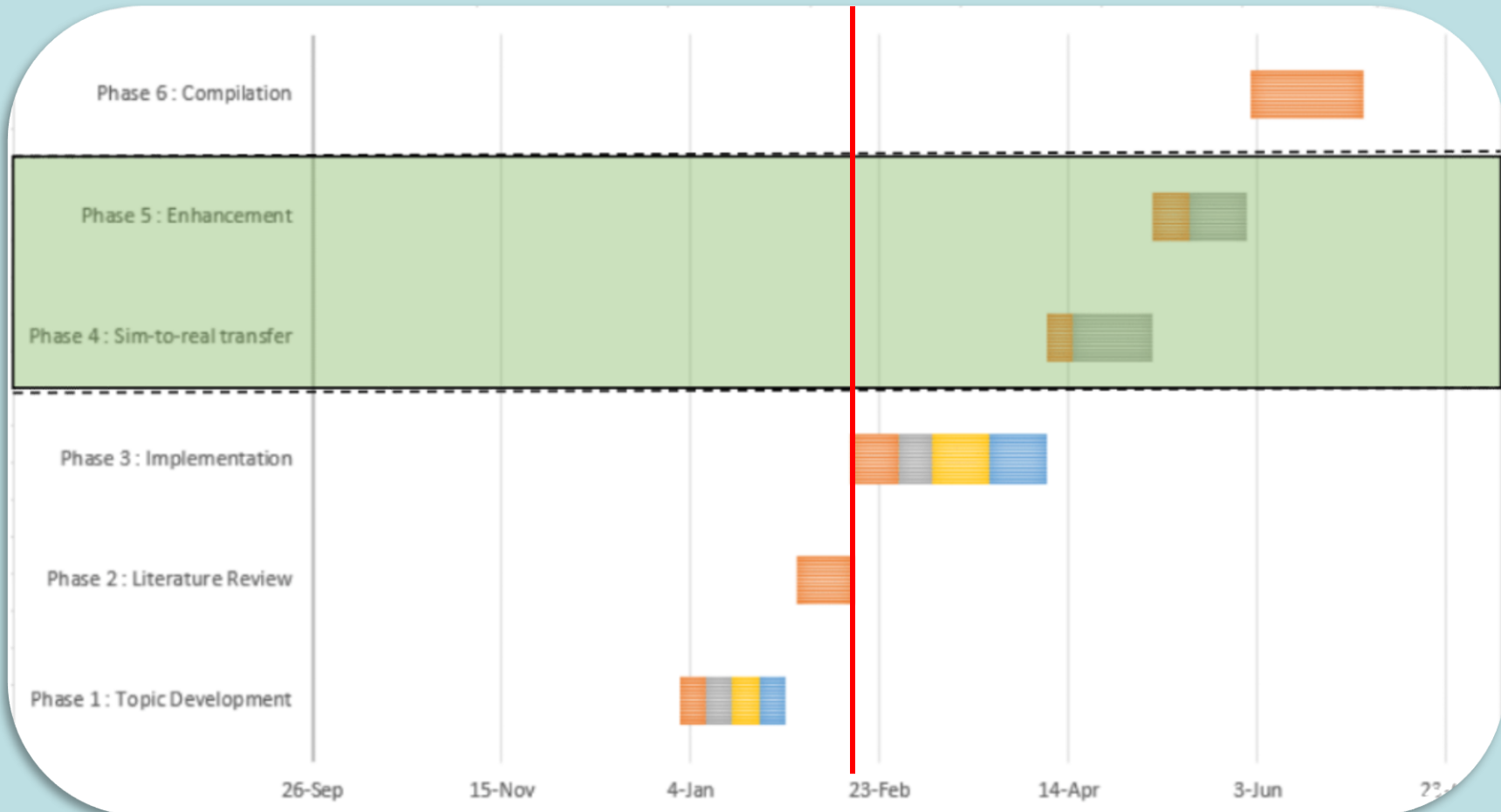
- Using Model-free Visual Reinforcement Learning for fabric manipulation to expose a flat seam for grasping operation

■ Methodology

- Exploration of existing simulation platforms for cloth simulation
- Selection of a suitable simulation environment
- Creation of synthetic images as input for the visual reinforcement learning task
- Exploration and comparison of existing deep reinforcement learning approaches
- Selection of a suitable learning algorithm for the task
- Performing domain randomization to transfer the policy to a real robot
- Exploration of alternate techniques to perform sim-to-real transfer
- Exploration of acceleration techniques like Hindsight Experience Reply and Imitation Learning to promote faster convergence
- Incorporation of one or more acceleration techniques depending on the convergence improvement in the existing pipeline

Thesis Proposal Overview

■ Plan



Weekly Review

09/02/21

■ Tasks

- Talk to Marvin, Pol about Simulation ✓
- Check feasibility of model free approach versus model based ✓
- Run the official repository ✗

Additional

- Forked the repo and added detailed Installation instructions in Readme ✓

■ Doubts / Queries

■ To-Do Items for Next Week

- Understand the existing repository completely
- Code Soft Actor Critic from scratch
- Literature Review from other papers

TO-DO LATER

- Update overall plan
- Testing various simulation platforms & selecting one

Weekly Review

16/02/21

- Tasks
- Literature Review from other papers ✓
- Run the official repository ⚠ *Computational issue*
- Understand the existing repository completely ⚠ *In progress*
- Code Soft Actor Critic from scratch ⚠ *In progress*
- Doubts / Queries
- To-Do Items for Next Week
- Code Soft Actor Critic from scratch
- Understand the existing repository completely
- Explore usage of intermediate testing on simulation before sim-to-real transfer
- Define use-case (for different type of towels (colour, texture, etc.) / one type)
- Check the no. of episodes needed
- Check computational requirements