Estimation of rotation of images using 1D phase correlation

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Overview

Expected delivery

November 14, 2019

Recent progress

- Created github repository (repository)
- Understanding the math in the relevant paper

The goal of the project is to determine the rotation between two images with very high accuracy and low computation cost.

Problem Definition

- High-accuracy image registration is an important fundamental task in many fields, such as image sensing, image/video processing, computer vision, industrial image recognition etc.
- Over the years, various techniques for image registration have been developed. Typical examples include image-correlation based methods, Fourier-transform based methods, image-feature based methods, and others.

Problem Definition

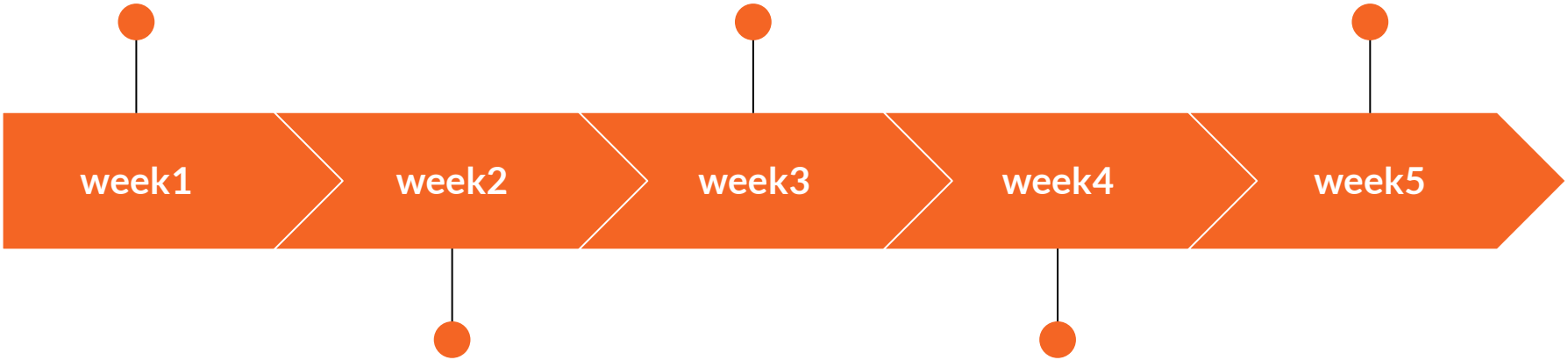
- Among many methods, image registration techniques using Phase-Only Correlation (POC) have attracted much attention due to their high accuracy and robust performance. We will take a closer look on the POC methods typically the 1D POC with adaptive line selection for robust estimation of the rotation between images using their polar mapped amplitude spectra.

Schedule

Understanding the math of the given paper (link to paper)

Implementing adaptive line selection

Integration of all modules



Visualising the polar mapped amplitude spectra

Implementing 1D phase only correlation

Deliverables

Goal 1

We hope to deliver an accurate estimation for rotation between two given images.

Goal 2

We wish to compare it to the 2d phase correlation methods and discuss its accuracy and speed.