I. Motivation and Description

One of the ongoing topics of research in computer vision is head-pose estimation. Effectively estimating head pose is an important prepossessing task for problems such as attention estimation, face identification and pose normalization. Due to importance of the problem to the area of computer vision, numerous papers have been proposed in literature addressing different solutions to the problem.

II. Dataset

To train our model and test the results we have chosen several datasets from the publicly available datasets. First dataset considered for the project is the Head Pose Dataset [1]. The dataset contains 2790 face images of 15 individuals with different pan and tilt angles. Second dataset selected for the project is CMU Multi-PIE [2]. The database contains more than 750,000 images of 337 people with various head poses.

Although datasets provided above are of good quality and suitable for the project, it is possible that as the project progresses new datasets will be added to the project and existing ones will be replaced. Such changes will be reported in the progress reports.

III. Methodology

For this project we will employ combination of computational geometry and computer vision techniques. As a first step we propose to perform triangulation on the face image. It is possible to perform scale normalization as to avoid spatial variation introduced by different image and face scales. To perform triangulation landmark point tracking algorithms might be used. As the second step, both image of the face and extracted triangulation can be fed into the learning network to track determine the head position.

As a result of training we would like to be able to report the the positional arguments provided an image: slant, pan and tilt. Positional argument representing individual’s head inclination towards the image is slant. And horizontal and vertical angles of the face are represented with pan and tilt. In addition to quantitative angle estimation, to provide user friendly description of the results, we would also lie to report camera position with respect to the from of the face. As being upper-right, middle-center and etc. In the case of frontal facing cameras where only head position is altered, we can report the pointing direction of the face in a similar fashion.

REFERENCES