

# Platform Invariant Low-Level Image Processing

Çağlar Aytekin and Moncef Gabbouj  
Tampere University of Technology

## NEED & INDUSTRIAL RELEVANCE

- A main issue faced by companies that are developing camera modules
  - Developed image processing algorithms needs tuning on different platforms, different cameras, camera settings, etc.
- A platform invariant set of algorithms are needed to overcome the need of fine-tuning

## PROJECT GOALS

- A robust, real-time, parameter-free set of image processing algorithms.
- Fast adaptation of image processing algorithms for different customers.
- Minimal dependency to illumination changes, camera settings and different platforms.

## OBJECTIVES

- The objective is to come up with a set of platform invariant image processing algorithms mainly by exploiting machine learning.

## APPROACH (RESEARCH METHODS)

- Approach 1 (Parameter-free)
  - Uses this dataset to train a CNN that learns to perform platform invariant image processing
- Approach 2
  - Generate a dictionary of images that are processed with ensured quality and use these images as a look-up table for adjusting parameters for new images.

## OUTCOME / DELIVERABLES

- A dataset of images and ground-truths for a set of image processing algorithms.
- A parameter-free system that executes platform-invariant image processing algorithms. (Approach 1)
- A look-up table based parameter dependent image processing algorithms. (Approach 2)
- Real-time implementation of both approaches.

## IMPACT

- Accomplishment of the proposed research will give rise to immediate applications on camera industry by eliminating the need of fine-tuning for each camera platform.