

## Research Internship

for

**Ms Binlin Zhang**

### **Realization of a Test Environment for Analyzing Motion Estimation based Super-Resolution Techniques**

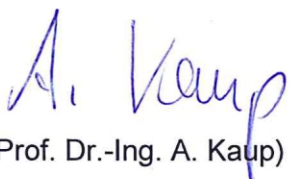
### **Realisierung eines Messaufbaus zur Untersuchung von auf Bewegungsschätzung basierenden Super-Resolution-Ansätzen**

Video surveillance camera systems often utilize cameras with a very wide field of view. Using Super-Resolution (SR) techniques, low resolved images and videos can be represented with a higher resolution. This is especially useful in areas, where permanent surveillance is necessary. Since high-resolution images require more storage space and expensive recording equipment, it is expedient to utilize cameras that record with a lower resolution. The advantage lies in a reduction of both price and required storage space. For calculating sub-pixel positions, which are mandatory for super-resolution, motion estimation is always necessary, ideally over the entire recorded scene. To examine the influence of this motion in a controlled fashion, a structure can be set up, that allows predefined movement of camera or objects in front of it.

Ms Zhang is presented with the task of implementing the controls and bringing into service of a traversing platform, which is able to execute certain movements. These movements should comprise constant, linear motion as well as more complex movements at varying speeds. A Raspberry Pi should control this traversing platform. Afterwards, different tests should be conducted in order to determine, which motion is best suited for SR techniques that are based on motion estimation. Hereby, both movement of objects, as well as motion of the whole scene in front of the camera should be examined. Finally, the implemented testing structure as well as the results for the different test cases from experiments should be summarized in a short report.

The current state of the art shall be determined by conducting a literature research. The thesis includes a well-documented presentation of the results; any source code created shall include sufficient annotation.

Begin: 8<sup>th</sup> November 2017

  
(Prof. Dr.-Ing. A. Kaup)