**DEVELOPMENT OF THE METHODS FOR CERAMIC TILES ACCELERATED PARALLEL IMAGE PROCESSING BASED ON AMD GRAPHICAL PROCESSING SYSTEM**

Project leader: Dr. Tomislav Keser, Assistant Professor

The computer vision technology is the backbone of visual information processing based on computer systems. Nowadays, many technical and technological processes, in order to achieve their goals, are relatively automated. Furthermore, their control algorithms are developed for processing tasks in both 1D and 2D domain. The algorithms are designed for linear processing of 1D data and 2D visual data as moving or still images. Being a direct consequence of automation level increasing, the control domain shifts from 1D processing into 2D processing stressing the need of raising the quality and quantity of production. On the one hand, 1D data processing can easily identify and design the required power of a computer system using linear interpolation modules of the data quantity and the time required to process them. On the other hand, 2D data image processing requires non-linear growth of computing power creating a problem in a computer control system design. One of the most adequate solutions, in economic and practical terms, is the control algorithms adaptation in terms of parallelized data processing in parallel and/or pseudo-parallel computer systems.

The aim of this research is to investigate the possibility of using and adapting the existing algorithms for image processing to work in real-time using graphics processor computer systems and operational assessment of ceramic tiles visual quality. In addition, the goal is to investigate and validate the graphical computer system application aiming at processing 2D data in terms of determining the processing acceleration compared to a classical CPU oriented computer system. Those systems that use graphics processing subsystems to process data for specific purposes already exist being mostly based on Nvidia CUDA technology. The research is based on the AMD opponent APP technology usage, which is, according to the researchers of this project, unfairly neglected being the more adequate solution for certain tasks than the aforementioned technology, which this study will prove.