Accelerating Higher Education Expansion and Development (AHEAD) Operation, RIC Project – Development of an Intelligent Camera with Real-Time Video Analytics System

Recruitment of Research Engineers

Date: 18 January 2021

Position	Job Roles	Skills Required
Research engineer (video processing)	Evaluating existing conventional vision algorithms to be implemented on an FPGA Designing the software (video management system) for receiving and viewing streams and other data form the newly designed cameras Implementing video analytic in software Any other software development requirement related to the project	Bachelor's degree in electronic engineering Familiarity with recent computer vision literature Fluency in programming (C++, Python, deep learning libraries)
Research engineer (vision on FPGA)	Carrying out research on electronic designs available for vision Carrying out research on deep learning algorithms Carrying out research on deep learning algorithm implementation in FPGA Preparing manuscripts for publications and patents Any other engineering research work related to the project	Bachelor's degree in electronic engineering Familiarity with recent computer vision literature Experience in FPGA-based development

Background

During the last two decades, surveillance cameras (commonly known as CCTV cameras) have moved from being devices used primarily in high security zones to a commoditized product used by a wider spectrum of the society to monitor what is happening in their surroundings – large retail stores, roads, and even homes. Without human operators, the usefulness of CCTV in its current form is questionable in the absence of true analytic processing. This is due to two reasons: first, the servers that receive video streams from hundreds of surveillance cameras do not have the computational capacity to analyze all the streams, the solution being edge processing (in-camera processing); second, deploying successful deep-learning based research work within devices is still a challenge. In this context, we propose to manufacture an intelligent camera (hardware) for edge processing for video analytics that would include a vision Intellectual Property (IP) core of our own. The feed from this camera will be the deep-features suitable for computationally less expensive video analytics in addition to the regular video stream. This needs a specialized real-time video analytics system (the software) that we will have to develop. More importantly, this software will include analytics such as anomaly detection – detecting events that could be deemed different from normal set of activities. Collaborating with the industry partner, Paraqum (Pvt.) Ltd., who has experiencing in developing and exporting high-tech electronic products, we will endeavor to sell our camera, IP and software overseas, thus earning foreign exchange.

Items to Be Commercialized: Intelligent surveillance camera: production-ready commercializable electronic product, generic vision semiconductor IP core plantable in any embedded vision system (FPGA/ASIC IP), real-time commercial-grade video analytics software for event and anomaly detection

Remuneration and Benefits

The research engineer position carries a monthly salary of Rs. 150,000 along with 12% EPF and 3% ETF. There is a possibility of a top-up allowance paid by our industrial collaborator, Paraqum Technologies, based on the periodic evaluation of performance. There is a statutory deduction of 8% for EPF (employee contribution) and your take home salary would be Rs. 150,000 less the 8% EPF contribution.

Possibility of contributing to high-quality publications and patents.

Guidance form academic staff members and senior engineers at Paraqum Technologies.

Pace of Work and Supervision

Your place of work will usually be at the Department of Electronic and Telecommunication Engineering, University of Moratuwa, and sometimes you will be required to work at Paraqum Technologies located in Kohuwala. You will be required to work from home during the pandemic period.

You will be working under the guidance of Dr. Ajith Pasqual, Dr. Ranga Rodrigo, Dr. Jayathu Samarawickrama, Dr. Chamira Edussooriya, senior engineers attached to Paraqum and senior research engineers.

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