مدينة زويل للعلوم والتكنولوجيا
Zewail City of Science and Technology

GRADUATION PROJECT CALL 2020-2021

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General Call Information

The Emerging Technologies and Ultra-Low Power Systems Group announces graduation project opportunity for final year students at the Nanotechnology and Nanoelectronics Engineering Program at Zewail City.

Student Selection Criteria

1. Students should be interested in CMOS image sensors and analog integrated circuits design.
2. Students should have prior experience using Cadence IC design tools for schematic design, layout, and have completed the NANENG 421 Analog IC Design Course.
3. Students are encouraged to apply as a team.

Project Description

Machine Vision CMOS image sensors have a wide range of applications such as, security cameras, self-driving cars, and satellite imaging. The image sensor market is expected to reach $24.8 billion dollars in 2023, and manufactures are typically looking for technology that allows them to reduce the pixel size, and increase the resolution of the array. The image sensor is composed of a pixel array, analog-front end circuits that includes variable gain amplifier, correlated double sampling block, and Analog to Digital Converter (ADC), in addition to digital processing unit.

The goal of this project is the design of CMOS image sensor using advanced technology nodes. The team will focus on the design of a pipeline ADC for high resolution cameras, analog interface circuitry, as well as the design and optimization of photodiodes using Sentaurus Device Software.

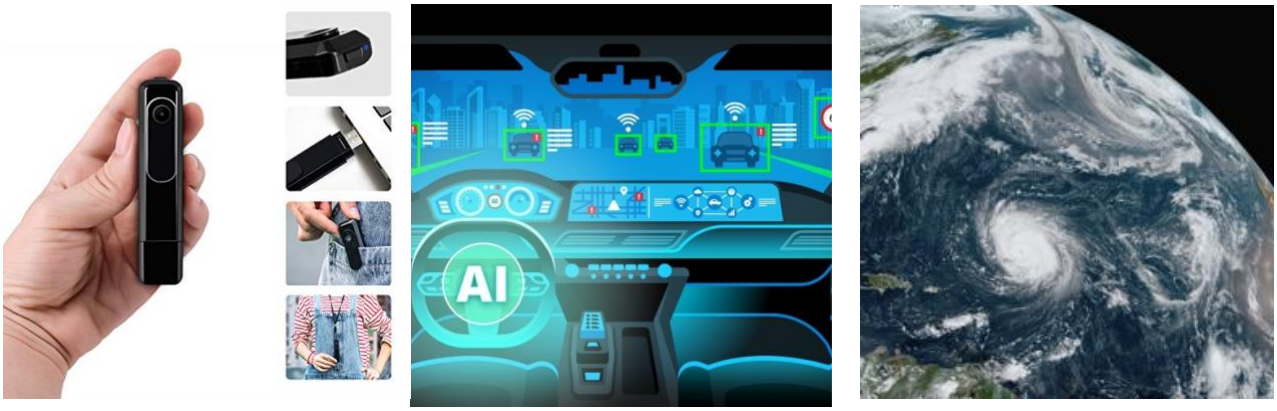

Figure 1 Applications of Image Sensors

Student Responsibilities: Students will participate in literature survey, integrated circuits schematic design and layout using Cadence IC Design tools, pixel array design and optimization using Sentaurus Device, as well as project documentation. The whole chip layout, including the pixel array layout and pads, will also be implemented.