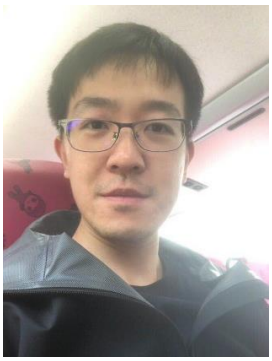
CURRENT POSTGRADUATE STUDENT

SURNAME	JIANG	
NAME	Yuqi	
PROGRAM	PhD in Surgery	
DATE OF REGISTRATION	2017.08	
SUPERVISOR	Professor Carmen CY POON	
FIELD OF RESEARCH / INTENDED THESIS TITLE	Biomedical Engineering / A FPGA-based CNN Inference Accelerator for Detecting Multiple Rare Types of Cancers during Endoscopy	
KEYWORDS FOR RESEARCH	Colorectal Cancer, Deep Learning, Therapeutic Endoscopy, FPGA	

RESEARCH STUDY:

1. Colorectal Polyp Detection in Colonoscopy based on Deep Learning Methods
    a. A novel polyp detection network is proposed based on transfer learning.
    b. A novel temporal polyp tracker is proposed based on correlation filter.
    c. A novel fusion strategy is proposed to fuse spatial and temporal information.

2. Implementation of a FPGA-based CNN Inference Accelerator for Wireless Therapeutic Colonoscopy
    a. Using network compression techniques such as pruning, quantization reduces model size.
    b. Propose a novel FPGA architecture for CNN acceleration with low latency, high performance and power efficiency.
    c. CNN FPGA-based accelerator can be fabricated into ASIC chip for integration with wireless capsule endoscope.

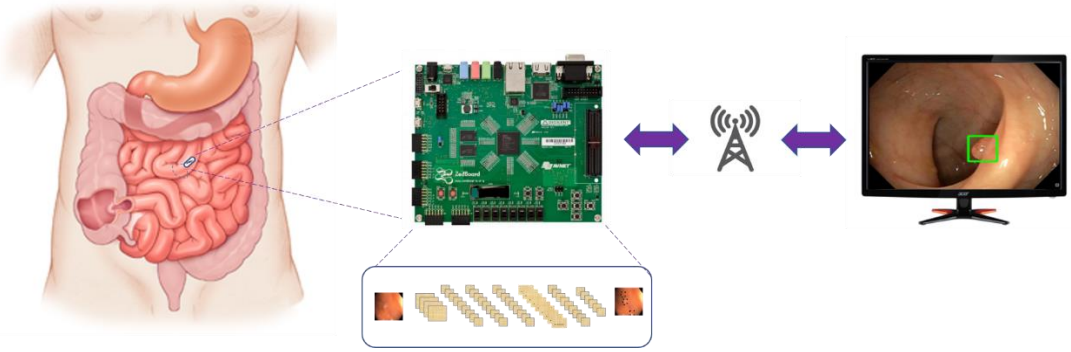


Figure 1, An illustration of FPGA-based CNN accelerator for wireless therapeutic colonoscopy

3. Transfer Learning Strategies for Detecting Multiple Rare Types of Cancers during Endoscopy
    a. Based on proposed methods, transferring the knowledge learned from colonoscopy to upper gastrointestinal diseases.

CONFERENCE TITLE / ABSTRACT / POSTER:

1. Yali Zheng, Ruikai Zhang, Ruoxi Yu, ***Yuqi Jiang***, Wing Chung Tony Mak, James Y. W. Lau, Carmen C. Y. Poon*, "Localisation of Colorectal Polyps by Convolutional Neural Network Features Learnt from White Light and Narrow Band Endoscopic Images of Multiple Databases", 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Honolulu, Hawaii, United States, 17-21 July, 2018.

2. Yali Zheng, Tony W.C. Mak, ***Yuqi Jiang***, Ruikai Zhang, Ruoxi Yu, Carmen C.Y. Poon*, and James Y.W. Lau*, "A Prospective Study Comparing Colorectal Polyp Detection Rates Between Endoscopists and AI-doscopist," 13th Annual Meeting of the European Society of Coloproctology, Nice, France, 26-28 Sept. 2018.