Application for Extending Study Period

Dear Sir/Madam,

My name is Jun Xu. I am a full-time Ph.D. student in Department of Computing. My chief supervisor is Prof. David Zhang and my co-supervisor is Prof. Lei Zhang. My normal study period in PolyU will end on July 02, 2017, and I would like to request for a ?-month extension of my Ph.D. study period. The justification of my request are detailed as follows:

1. Thesis scope and contents

The research topic of my Ph.D. thesis focuses on proposing novel optimization and learning models for image restoration problems (e.g., image denoising). My goal is to develop a new image denoising framework, which is able to enhance the quality of synthetic and realistic noisy images with the aid of various image priors. The proposed models and the associated algorithms are expected to surpass the state-of-the-art approaches under theoretical properties as well as quantitative evaluations.

1. Current research progress

I have finished 75% of my thesis work. Specifically, I proposed three novel algorithms, which have achieved state-of-the-art performance on removing additive white Gaussian noise as well as realistic noise on real-world noisy images. Different from the existing methods, the models I proposed not only achieve effective performance on noise removal, but also achieve efficient denoising. In the first work, I proposed to directly learn non-local self-similarity of the natural images, which has never been tried in the previous work. This work has been published in the IEEE International Conference on Computer Vision (ICCV) 2015, a top conference in computer vision and machine learning. In the second work, I proposed to employ the external priors of natural clean images to guide the learning process of the internal priors of the given noisy image, and this can make the learned priors more adaptive to the given test image. I has written a 13-page paper on this work and will submit it to the IEEE Transactions on Image Processing, a top journal in computer vision and image processing. In the third work, I have proposed a multi-channel weighted nuclear norm minimization model for color image denoising. This work has been submitted to the IEEE International Conference on Computer Vision (ICCV) 2017. Recently, I have been working on developing a new discriminative learning based model, which is expected to achieve better performance.

1. Reason of extending my study period

To make my thesis more solid and comprehensive, both of my supervisors suggested me to refine the discriminative learning based model, conduct more experiments on different problems in image restoration, and perform more theoretical analysis to validate the proposed model. Therefore, I need more time to refine the proposed model, do theoretical analysis, conduct experiments, and write paper on the proposed model. The proposed model, if succeeds, will be a great contribution of my thesis and produce high impact in the field of computer vision and image restoration area.

Below is my proposed study plan during the extended period from July 03 2017 to ???? 2018.

**03/07/2017 - 30/09/2017:**

* Finish the training data collection for the proposed model, including the degraded images and corresponding “ground truth” images.
* Conduct experiments on image restoration tasks (e.g., raw image denoising, real-world noisy image denoising).
* Based on the experimental results, refine the proposed model, adjust and improve the training and testing strategies.
* Compare the proposed model with the-state-of-the-art methods.
* Finish the experiments, investigate the theoretical and applicable innovations of the proposed model.

**01/10/2017 - 30/12/2017:**

* Consolidate all the work I have done in the Ph.D. study.
* Finish the Ph.D. thesis and submit for review.

I sincerely petition for your approval of extending my study period for ? months. I will submit my thesis on or before ???? 2018. My supervisor Prof. Lei Zhang has agreed to cover all my study expense by his fund. Your approval of the application will be highly appreciated.

Thank you very much for your time and consideration!

Best regards,

Jun Xu, Department of Computing

Signature: Date:

Chief Supervisor in PolyU: Prof. David Zhang

Signature: Date:

Co-Supervisor in PolyU: Prof. Lei Zhang

Signature: Date: