Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : zhang Given names : lu

Status (prof., assistant prof., …) : Associate Professor

Laboratory : IETR Website address : www.ietr.fr

Institution : INSA Rennes Website address : www.insa-rennes.fr

Scientific competence of the supervisor:

Ass. Prof. Zhang's background is Signal and Image processing. Her expertise is in the field of saliency detection and image/video quality evaluation. Ass. Prof. Le Meur worked a lot in the computer vision domain.

Two major publications in the field proposed for the PhD :

1. Le Meur, O., & Coutrot, A. (2016). Introducing context-dependent and spatially-variant viewing biases in saccadic models. Vision research, 121, 72-84.
2. Le Meur, O., Le Callet, P., Barba, D., & Thoreau, D. (2006). A coherent computational approach to model bottom-up visual attention. IEEE transactions on pattern analysis and machine intelligence, 28(5), 802-817.

Website address of the personal page : http://luzhang.perso.insa-rennes.fr/

Supervisor's email : lu.ge@insa-rennes.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** I-7

Title : Deep-learning-based model for saliency prediction

Subject :

Visual attention is the mechanism allowing to focus our visual processing resources on behaviorally relevant visual information. Eye movements, revealing where and how observers look within a scene, are the key factor of visual attention. Eye movements are mainly composed by fixations and saccades. Fixations aim to bring objects of interest onto the fovea, where the visual acuity is maximum. Saccades are ballistic changes in eye position, allowing to jump from one position to another. The model for predicting visual attention is an important technic of artificial intelligence (AI).

Deep learning models are loosely related to information processing and communication patterns in a biological nervous system. Until now, it is the most important and efficient model in the field of AI. Since the visual system of human is biologically composed of stimuli and neuronal responses between eyes and brain, the deep learning model turns out to be the most natural way to model our visual system. It can automatically extract high-level features from the data and model the distribution of eye fixations in a more accurate way.

The objective of the proposed Phd thesis is to design a new deep-learning-based model for predicting eye fixations. The PhD candidate can revisit the saccadic models in the team to improve their ability; get deep in the theoretical

Keywords :

Visual attention, fixation prediction, saccade prediction, deep learning, saliency detection

Expected collaborations :

Background required from the applicant :

Required : Master in computer science or electrical engineering, signal processing, programming in C/C++, matlab;
Optionnal : image processing, deep learning, programming in python

Existence of a PDF file detailing the proposal ("yes" or "no") : yes

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