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 : LAURENT   Given names : Hélène

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

Laboratory : PRISME

Website address : https://www.univ-orleans.fr/prisme

Institution : INSA CVL

Website address : http://www.insa-centrevaldeloire.fr

Scientific competence of the supervisor:

Member of the Image and Vision group, H. LAURENT research interests include supervised evaluation of image processing algorithms and the development and validation of dedicated applications. Supervised evaluation which relies on the computation of adequacy scores between results and corresponding ground truths is well suited to the development of application-dependent processing techniques. It has been successfully applied in FUI projects conducted with R&D units of high-tech companies.

Two major publications in the field proposed for the PhD :

1. B. Hemery, H. Laurent, B. Emile, C. Rosenberger, "Evaluation metric of an image understanding result", Journal of Electronic Imaging, Volume 24, Issue 1, 2015

2. J.-F. Collumeau, H. Laurent, B. Emile, R. Leconge, "Hand Shape Extraction for Contactless Remote Control", International Conference on Computer Vision Theory and Applications, pages 435-440, Berlin, 2015

Website address of the personal page :

Supervisor's email : helene.laurent@insa-cvl.fr

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

Title : Gesture recognition for remote control

Subject :

Remote non-contact control concerns any voluntary mode of interaction with an equipment without any contact neither with the system itself nor with a remote control device. The underlying principle may be summerized as follows "come as you are" as no additional device is necessary to communicate with the equipment. Among the potential solutions, gesture-based control is the most versatile option and has been particularly considered in a number of applications such as assistance to disabled persons or medical engineering. We developed several projects (CORTECS-Centralising Operating-Room Tower with Energy-Caring System and SMILE-Sterile Manipuling Interface for Lighting Equipment) which especially aimed at improving the working comfort for the surgical team by providing direct vision-based remote non-contact control of operating rooms equipments through hand gesture recognition. The proposed thesis aims at continuing the research within this framework which involves a large part of computer vision techniques in order to further develop systems robust to environmental constraints - namely dynamic illumination changes, complex backgrounds and multiple "speakers" presence... Ergonomics are essential as well for proposing a non-intrusive, intuitive and user-friendly device. The proposal of an adaptive static and/or dynamic gestural vocabulary providing technical robustness and secure authentication will be investigated.

Keywords :

remote control, hand gesture control, ergonomics, segmentation, hand descriptor, posture recognition and tracking

Expected collaborations :

PRISME laboratory: members of the Image and Vision group

Background required from the applicant :

image and video processing, computer programming skills (C/C++/Matlab/OpenCV), machine learning, very good communication skills in English (both spoken and written), speaking French is a plus, willingness to learn is expected otherwise

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

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