PhD proposal – TIMC-IMAG laboratory, Anatoscope – Grenoble, France

Robust multi-sensor motion capture

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This PhD takes place in the context of innovative computer-based tools for education. More precisely, a multi-disciplinary team involving several laboratories has developed a project named "Living Book of Anatomy". The idea is to use motion capture technology (a Kinect camera) and augmented reality in order to give to a medical or sport student the feeling of seeing though his/her own body in action. A model is automatically sized to the user, animated from motion input and rendered in real time. A demonstration is visible at: https://www.youtube.com/watch?v=EUzlWEkeZxc&feature=youtu.be

Despite big achievements, the existing system still limits the possible movements of the user. We propose to combine multiple sensors in order to build a more accurate view of the user in the educational environment. This raises two main scientific issues: firstly, the method should adapt to non or *poorly calibrated* sensors – by non-calibrated we mean that the position of sensor with respect to the others might not be precisely defined. Secondly, sensors may have very *different resolutions or field of views*. Data fusion from these sensors must be able to handle these two issues and should be robust to noise and outliers. Real-time processing is a last challenging constraint.

This thesis takes place in the context a collaborative 3,5-year project named "An@tomy2020" following the "Living Book of Anatomy". This project includes 5 laboratories and a company.

Applicants: Candidates should have a good Master degree or equivalent degree in computer science. They must have a strong interest in experimental work and excellent programming skills (C++) if possible with practical knowledge of computer vision. Experience with OpenCV would be appreciated.

Applicants should send their CV and motivation letter to jocelyne.troccaz@imag.fr by mid-November.