Departamento de Ingeniería Electrónica
Universidad Politécnica de Madrid

PFC / MSc Thesis Offer

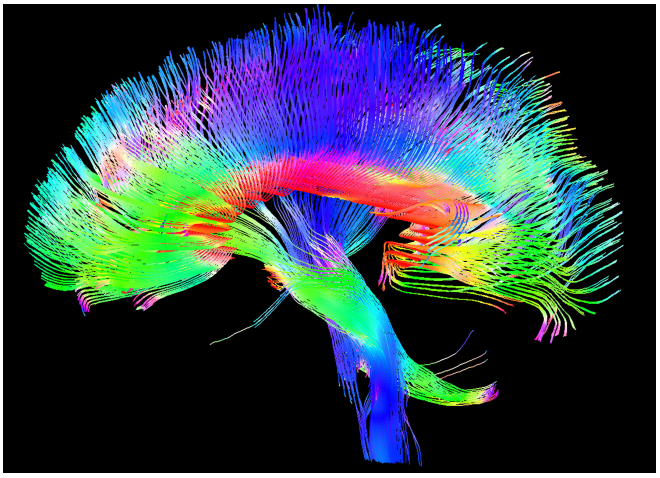
at the Biomedical Image Technologies Group

The Biomedical Image Technologies (BIT, http://www.die.upm.es/im) offers **master** and **undergraduate** students two **PFC / MSc Thesis** in

Computational methods for segmentation and registration of diffusion MRI of the human brain

Motivation:

Diffusion Magnetic Resonance Imaging (dMRI) is the most widely used image modality for mapping the structural wiring inside the human living-brain. This mapping is extracted from the dMRI data through a chain of signal processing elements, obtaining the so-called *connectome* (the actual "wiring map") as outcome. However, a number of pitfalls and challenges in the dMRI data processing must be overcome to ensure the applicability of connectivity analyses in the clinical routine. Some of these research needs will be covered in the described proposal.



Goals:

We offer two PFC / MSc Thesis works that will contribute on the improvement and assessment of existing connectome extraction tools. More precisely, the student will work at the initial steps of the processing chain, on two well-known image techniques called *segmentation* and *registration,* that are crucial for the downstream results. Depending on the profile of the student, the work will be further adapted to his/her interests, and this broad goal will be restricted to affordable points of the segmentation and registration problems.

Collaboration Grants:

Candidates eligible for the Collaboration Grants offered by Spanish Ministry of Education, Culture, and Sports (http://www.boe.es/boe/dias/2013/07/13/pdfs/BOE-A-2013-7736.pdf) will be prioritized and aided in their application process (deadline: 30th September 2013).

Requirements:

- Good programming skills (C++ and/or Python)
- Basic background on image processing
- Interest in human brain imaging and connectomics

Still interested?

Please contact Oscar Esteban (oesteban@die.upm.es), Room C203, ETSI Telecomunicación.

B I T Biomedical Image Technology

POLITÉCNICA "Ingeniamos el futuro" — CAMPUS DE EXCELENCIA INTERNACIONAL