

## Open HiWi (research assistant) Position

### Open Diploma, Master, and Bachelor Theses

#### Topic

Positron emission tomography (PET) is a medical technique that generates functional images of the human body including the brain. Recently, we successfully applied a hypothesis-free analytical technique known as independent component analysis (ICA) to identify covariance patterns in PET data (Yakushev et al., 2013). ICA is an advanced computational method for separating a multivariate signal into additive components (Hyvärinen and Oja, 2000). In the above study, we applied software called Group ICA Toolbox (GIFT, <http://mialab.mrn.org/software/gift/index.html>) that is actually developed for another imaging technique (fMRI). As compared to that technique, PET provides a different kind of signal and has specific sources of variance. Thus, the aim of this work is to test performance of ICA in PET data, by adjusting the above software package (i.e. scripts) to the needs of PET.

- The project can be started at any time and can potentially be extended to a master thesis.
- Work load: 10-15 hours/week
- Fee: 400 EUR
- Email addresses of former students (for references) can be obtained upon request, at any time and without obligation

#### Environment

We offer an intensive supervision, but initiative is very welcome. Working environment will be provided at the Dept. of Nuclear Medicine at the Klinikum rechts der Isar (Ismaninger Str. 22, 81675 München).

#### Requirements

The student should be interested in medical imaging and image processing. Knowledge of Matlab is required. A strong mathematical background in linear algebra is advantageous.

#### Supervision / contacts

This project is jointly proposed between the Chair for Computer Aided Medical Procedures (Prof. Nassir Navab, I16, Department of Informatics, TUM) and the Dept. of Nuclear Medicine (Prof. Markus Schwaiger, Klinikum rechts der Isar, TUM).

**Thesis advisor:** Prof. Nassir Navab

**Supervisor:** Dr. Igor Yakushev

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