

# Probabilistic and Dynamic Matching of Related Signals

Project Management and Software Development  
for Medical Applications

## General Info

Project Title: [Probabilistic and Dynamic Matching of Related Signals](#)

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## Project Abstract

Simple 1D signals are used in a wide variety of medical application, such as ECG, EEG, respiratory surrogates, spatial relations or other vital signs. In order to compare multiple patients, these signals need to be compared and matched.

## Student's Tasks Description

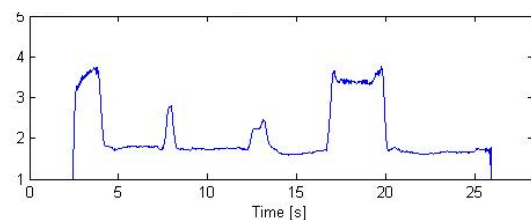
The student will research literature on biological signal matching and present several approaches towards probabilistic and dynamic signal matching. Together with the supervisory team, one or more suitable algorithms will be chosen and first implemented in Matlab. Furthermore, the best performing algorithm will be implemented in C++ (ideally for GPU-computation).

## Technical Prerequisites

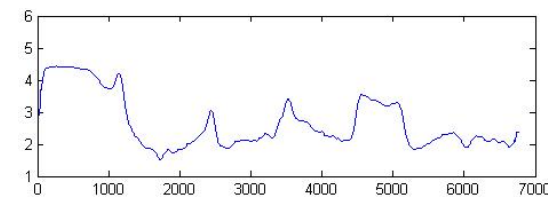
Algorithm design in Matlab, final implementation in C++ (optionally CUDA or OpenGL).

## Signal Examples:

Signal 1



Signal 2



Outcome: Probability that signal 1 and 2 are the same, considering different sampling rates, local scaling, different relative amplitudes,...

## Administrative Info

Working Time: 150 hours

Project Location: Garching

Required Equipment: The computer is set up and can be accessed using remote desktop.

## Timeline and Milestones

The timeline and milestones are closely connected to the outline of the lecture. Therefore, kick-off, midterm and final presentations are required. Further details and milestones will be set to fit the student's skills.

Please send the completed document to us ([Ralf.stauder@tum.de](mailto:Ralf.stauder@tum.de)) before the project proposal deadline, April 8<sup>th</sup>. Please note that this proposal will be evaluated by the BMC coordinators and will be assigned to a student only in the case of acceptance.