The Fraunhofer-Chalmers Research Centre for Industrial Mathematics (FCC) is offering contract research, services, algorithms and software based on advanced mathematics within Modeling, Simulation, Optimization, and Data Analysis, which provides a significant leading edge in industrial innovation of products and production systems. Since the start in 2001, the centre has successfully proved this together with more than 200 clients in over 500 industrial and public projects together with the automotive and vehicle, metrology, pharmaceutical, wood and paper, and electronics industries.

We have an open position for an ambitious and talented

PhD Student – Learning Dynamical Systems in Combination Therapy

About us
FCC's department of systems and data analysis conducts research, application and development of computational methods, software tools, data analysis, and dynamic systems modeling on different levels of abstraction utilizing time and spatially resolved measurement data. Our vision is to employ mathematics as a technology to improve product and process development by utilizing the ever-increasing amounts of industrial data and leverage on a thorough mathematical understanding of algorithms and methods for machine learning and artificial intelligence. We are located in modern premises at the Chalmers Science Park, campus Johanneberg, Gothenburg, Sweden.

PhD Project
A particular challenge in drug discovery and development is to assess the effect of combinations of therapies such as drug-drug or drug-irradiation. A data driven model-based approach relying on pre-clinical data to rank combinations would be a highly useful tool for improving the rate of success in selecting drug combinations of high value. The aim of the project is to develop and apply novel numerical methods and algorithms to learn dynamical systems from population time-series data obtained from combination therapy as well as computational tools to assess, quantify, and rank the efficacy of different drug combinations. Methodologies that may be employed during the course of the project are particle Markov Chain Monte Carlo methodology, Gaussian process learning, and probabilistic programming.

The student will be employed by the Fraunhofer-Chalmers Center, and enrolled at the research school in applied mathematics and mathematical statistics at the Department of Mathematical Sciences, Chalmers University of Technology. A maximum of 10% teaching is included in the position, and the PhD should be completed within 4,5 years. The PhD project is part of an existing collaboration with Merck on mathematical methods for combination therapy. Merck supports the project with data and challenging applied problems and there will be opportunities for shorter or longer visits to the company during the course of the project.

Your Profile
You have a Master of Science, or equivalent, and a strong background in mathematics. Concurrent method development and implementation of algorithms is integral to the applied research carried out at FCC and good programming skills (e.g.,Python, Mathematica, R) are therefore required. You will work together with a team of researchers and engineers with a thorough understanding of both applied mathematics, statistics, and pharmaceutical applications. You are a team player with strong interest in industrial applications, but also expected to work autonomously, develop your own ideas and communicate results to the scientific community.

Interested?
Welcome to submit your electronic application including cover letter, CV, course grades and other relevant work such as master thesis, no later than March 17 to: recruit@fcc.chalmers.se

We aim for a project start June 1, 2019, but you could still apply if you finalize your master thesis during the spring term. For questions about the position, please contact head of department Mats Jirstrand, mats.jirstrand@fcc.chalmers.se, +46 730 794303.