

## Process Mining in Personalized Medicine

Process mining has been applied successfully in a variety of domains, e.g., production, banking, logistics. Process mining techniques are useful to discover actual business processes and make them accessible to multiple stakeholders like process owners and participants. This often leads to interesting and often surprising insights showing that in many cases the expected process may be very different from reality. Process mining can also uncover performance issues, the use of resources, and hidden costs. All of this is also of particular interest in healthcare processes.

The goal of this master project is to apply process mining techniques on a large data set about the complete treatment cycle of patients. The project will be in cooperation with the clinic network Mount Sinai. Located in the New York metropolitan area, Mount Sinai combines the Icahn School of Medicine at Mount Sinai, eight hospital campuses and 13 free-standing joint venture centers. As part of this cooperation, Mount Sinai provides a unique data set containing detailed personalized medical data of a large set of patients and treatments. The data, stored in a medical data warehouse, contains not only personal information like patients age, single treatments, medication, and billing details but also cross-organizational information. Based on this, patients are traceable across multiple sites even after inpatient treatment.

The project gives you the opportunity to work with real-life individual patient flows through the Mount Sinai health system. You will start by exploring the data warehouse and developing a tool to extract event logs for selected process mining use cases. Based on these logs, you will run a complete process mining project. Of particular interest are the discovery and modeling of patient flows through the health system, the analysis of different performance measurements, the detection of process deviations, and also possible violations of quality standards.

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