Healthcare Therapy Scheduling Optimization

TeraCrunch Socratez™ Platform Modules

DATA PREPARATION

Identifying fields for the model, conversion of categorical data types to numeric types, featurization of text data, and joining of relevant tables in a relational database. Data imputation for missing values

FEATURE ENGINEERING

Feature engineering is the process of using knowledge of the data to create features that make machine learning algorithms work. Coming up with features is difficult, time-consuming, requires expert knowledge.

MODEL TRAINING

Explores & identifies best options from a range of machine learning models (generalized linear models, decision trees, random forests, gradient boosted decision trees and neural networks).

TEST & SIMULATION

Explores changes in predictions if inputs are changed. This allows exploration of the underlying causal effects in the model.

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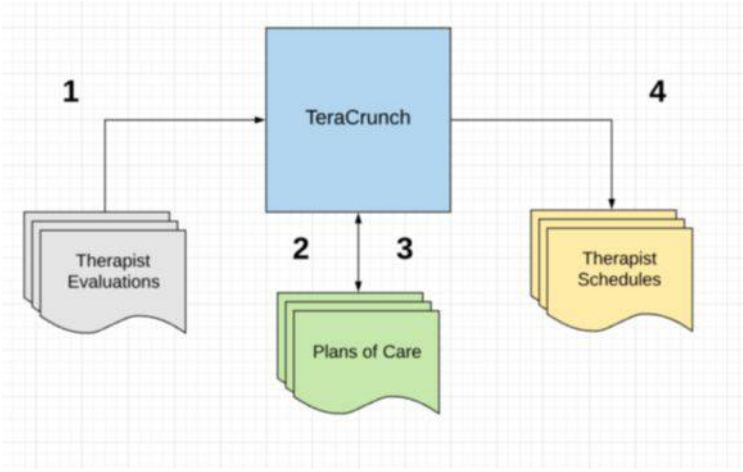
Case Study
Optimal Plan of Care and schedule optimization for therapy using TeraCrunch™ Solution

About The Client
Large hospital system

Problem Overview
Individualized therapy models requires regular evaluations from which Plan(s) of Care are developed, adjusted, and optimized, but this process can be expensive to standardize, implement and scale.

TeraCrunch Solution

- Model that takes as an input therapists evaluations and individualized Plan of Care and constructing a therapy schedule that reflects the therapeutic needs of patients and the contrasts of therapists.
- Optimal therapeutic pathways are based on therapist evaluations on intake and throughout inpatient stay.
- Pathways are defined as a mixture of at least physical and occupational therapy (PT and OT, respectively), optionally including speech therapy (ST) as needed, for 180 minutes per day. CMS requires that inpatients receive a minimum of two therapy modalities each day, but does not specify the distribution between these therapies.
- Once the therapeutic pathway is identified for a patient, our solution will schedule time with a therapist in each discipline based on patient need. For example, if a patient needs 75 minutes of PT, 75 minutes of OT, and 30 minutes of ST, then these blocks of time will be allotted to a physical therapist, an occupational therapist, and a speech therapist on a daily basis. To the extent possible, patients will be assigned to the same therapists while in residence.
- Other constraints include total minutes of therapy a day, breaks, and hours of operation.
- Integrates best in class analytics and domain expertise during training of models.
- The tool is in a CSV/Excel format with an automated optimized schedule that reflects the above considerations.



Impact on the business
In production, our solution has reduced the time it takes to produce a Plan of Care ("Therapeutic Pathway") from therapist evaluations by 80%. Integration with large Electronic Medical Records (EMR) provider in progress.

TeraCrunch