

Data4Good Hackathon Vienna 2019

April 27-28, 2019

Define the Problem

Within the framework of their 24-hour care services for persons with physical disabilities, Hilfswerk Österreich provide a matching service between patients and care providers. These matchings require intense care and administrative effort; accordingly, early cancellations caused by unsuitable combinations are undesirable.

Our goal during the hackathon is to examine historical cases, in order to get insights on which data features are associated with cancellations. Another goal is interpretability of the results: we love algorithms and models, but we also aim at providing some valuable clues to Hilfswerk.

The logo for Data4Good Hackathon Vienna 2019 is a stylized heart shape composed of several overlapping geometric polygons in shades of red, pink, and green. The text "Data4Good Hackathon Vienna 2019" is written in white inside the red portion of the heart.

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Goals & Accomplishments

Goals

- Text mining and sentiment analysis of the text fields
- Creating a machine learning model to predict status
- Time-series analysis individual cases

Accomplishments

- Assessed the feasibility of time-series analysis on the available data
- Created multiple random forest classification models
- Performed text mining and sentiment analysis on text from client conversations and caregiver conversations
- Used this analysis to engineer additional input variables which increased the performance of the model
- We used random forest models because they are easy to interpret

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Challenges Encountered

- Very few observations (approx. 90 cases in total)
- Extracting information from existing variables
- Combining text and time-series data with categorical and numerical inputs

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Insights

- Both normal and conflicted cases have positive sentiment but conflicted cases have more negative approaches
- The sentiments of the text one of the most important predictors of whether the case is a conflict or not
- Usage of the word nicht in the caregiver text is important
- Many conflicts are in the first three months of care

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The Team



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