

# Master Research Proposal

**Topic** Create & evaluate a predictive model for engagement drop-off for digital health applications

## Background:

Digital health applications have been on the rise in recent years, particularly in the management of chronic disease, as these patient-centric applications can extend care into patients' homes and provide self-management assistance crucial to improving patient outcomes [1]. A major challenge in the success of these digital health applications, however, is the high rate of attrition. An observational trial of a large real-world cohort revealed only a 2% sustained, continuous use of the application that would actually improve clinical outcomes [2].

This master thesis will be conducted together with a startup, Veta Health. This is a digital health company that delivers remote care solutions that help patients with chronic conditions achieve better health outcomes from the comfort of their homes. Veta Health maximizes patient engagement and participation in its programs through the delivery of a personalized experience. In addition to the software solution (Prosper), Veta Health deploys care teams to connect with the patient directly when an intervention is required.

In order to optimize the timing on engagement-based interventions, the goal of this thesis is to develop a method that seeks to better understand which patients are at risk of attrition.

## Research Question (to be further defined and refined):

- How can current methods in ML and AI be used to classify and predict patient engagement with digital health applications

## The proposed work consists of the following parts:

- Literature research: identify relevant work resulting in a comprehensive overview about existing studies on user engagement with digital health applications
- Development of different ML or AI models to classify engagement and identify patients that are at risk of attrition
- Evaluation of the implemented models regarding their accuracy on the collected data
- Evaluation of the models with a real-world dataset

The thesis must contain a detailed description of all developed and used algorithms, as well as a profound result evaluation and discussion. The implemented code has to be documented and provided. An extended research on literature, existing patents, and related work in the corresponding areas has to be performed.

Supervisors:

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## References:

- [1] Grady PA, Gough LL. Self-management: A comprehensive approach to management of chronic conditions. *Am J Public Health*. 2014 Aug;104(8):e25–e31. doi: 10.2105/ajph.2014.302041.
- [2] Helander E, Kaipainen K, Korhonen I, Wansink B. Factors related to sustained use of a free mobile app for dietary self-monitoring with photography and peer feedback: Retrospective cohort study. *J Med Internet Res*. 2014 Apr 15;16(4):e109.

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