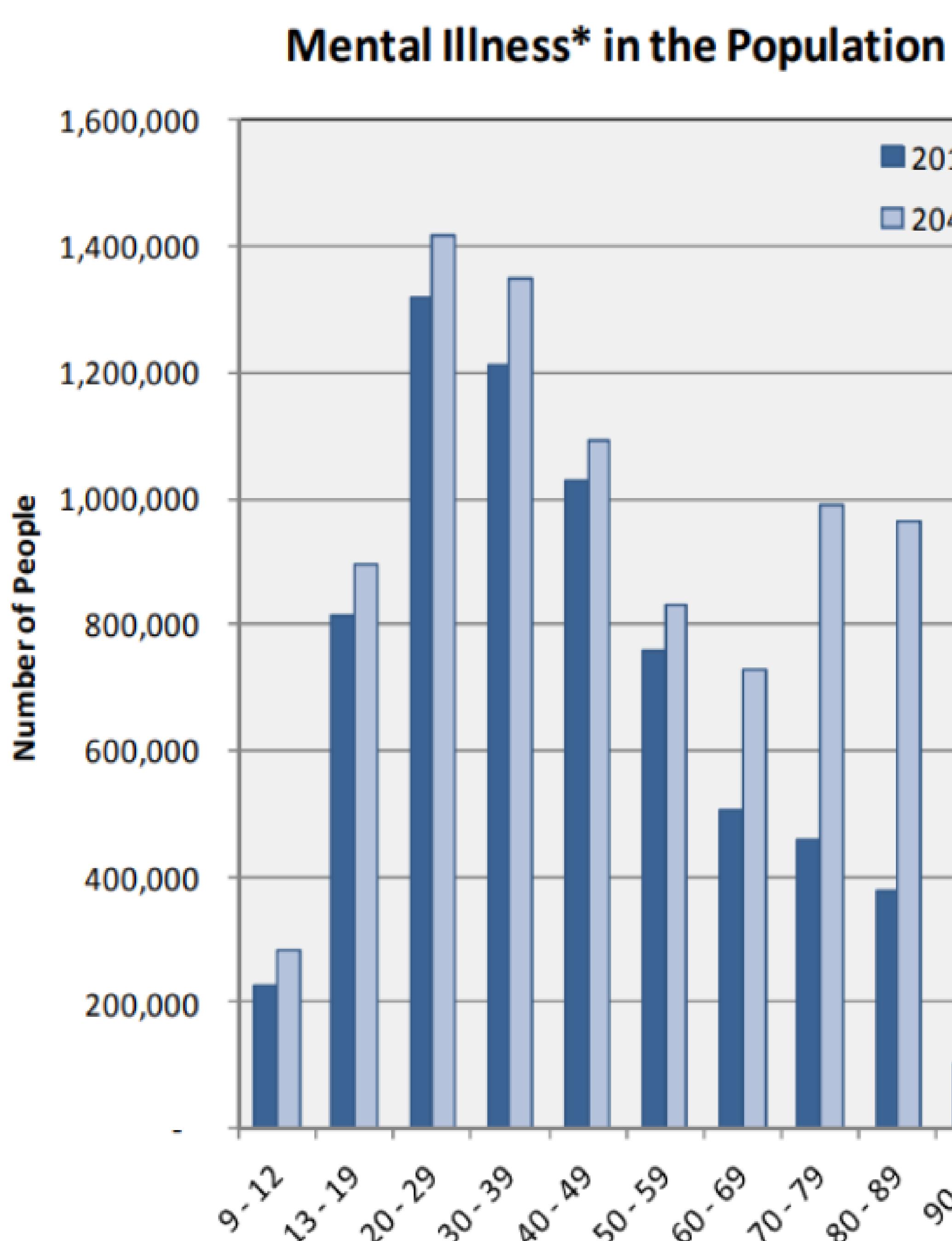


Software Architecture for Natural Language Processing/AI applied to Mental Health

Motivation

It is estimated that 1 million Canadians have a eating disorders, 5 million Canadians have a mental health disorders and >50% of these individuals are not being treated

Individuals with mental health related problems are not seeking help themselves and forums/social media can be an outlet for many of these people. Natural Language Processing has the potential by using an individual's online presence to predict conditions from users and potentially lead to providing help if possible before it becomes harmful.



NLP Models

Search for Symptoms of Depression

Question: How can we break down the concept of depression in order to detect it in someone based on a given sentence?

Answer: Look for indications of different possible symptoms of depression.

Look at a series of sentences and rank which sentences have the highest correlation to each given symptom.



Early Detection of signs of Anorexia

Question: How can we process pieces of evidence sequentially to detect early traces of anorexia as soon as possible?

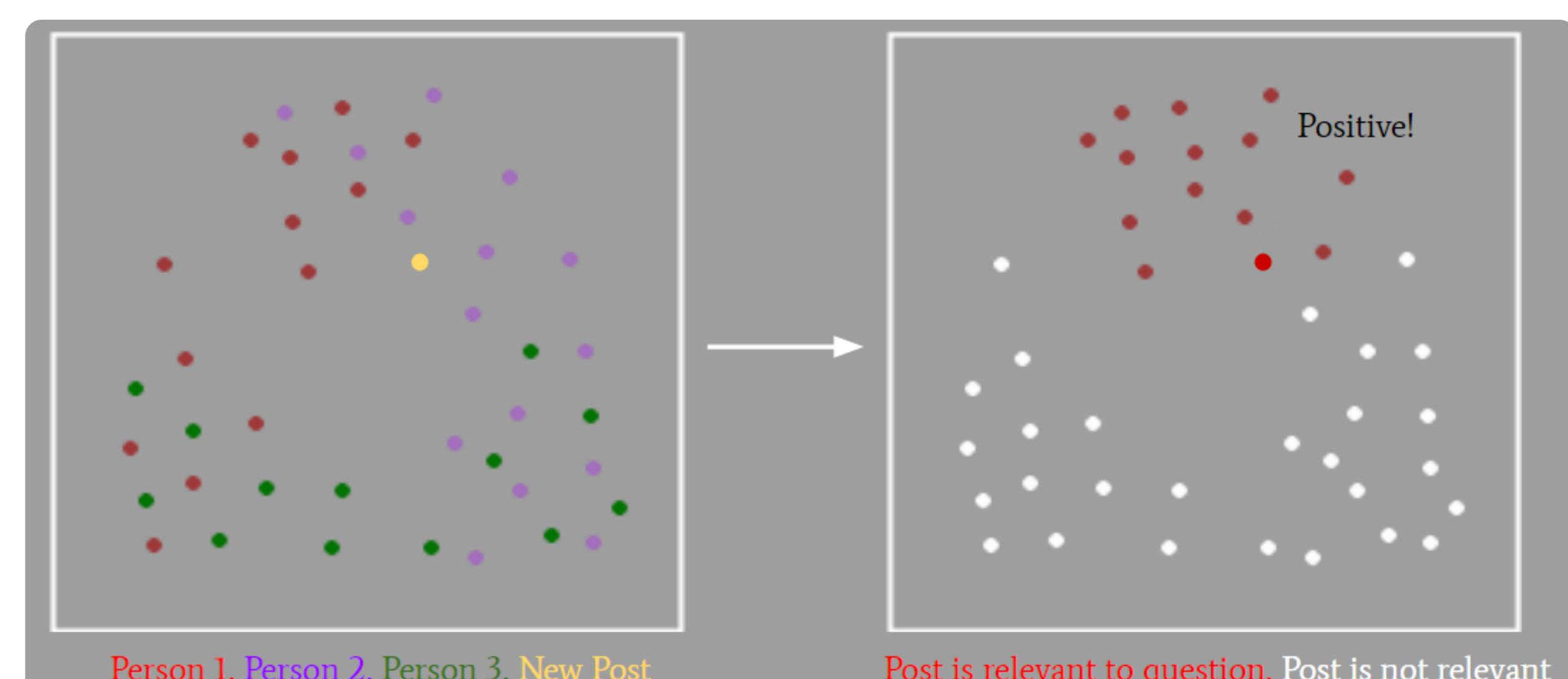
Answer: Topic Modelling is a technique that is capable of analyzing sets of documents to detect word and phrase patterns.

BERTopic Offers a wide range of flexibility, allowing the team to build the topics to our preferences, and save competition time and resources



Detecting the Signs of Eating Disorders

Question: How can we determine if someone shows signs of eating disorders based on a filled questionnaire?



CLEF eRisk

Competition that is held yearly since 2017 in order to further research into early risk prediction on the internet for detecting potential mental health disorders, eating disorders, potential crime, etc...



Teams compete using natural language processing models to attempt to predict these signs using posts from users and are compared based on a range of metrics.



Results

Metric	Our Result	Previous Year's Result
Average Precision	0.175	0.319
NDCG	0.636	0.596
Precision	0.635	0.586
Recall	0.644	0.939
F-score	0.639	0.721
MAE	1.67	1.98
MZOE	0.73	0.89

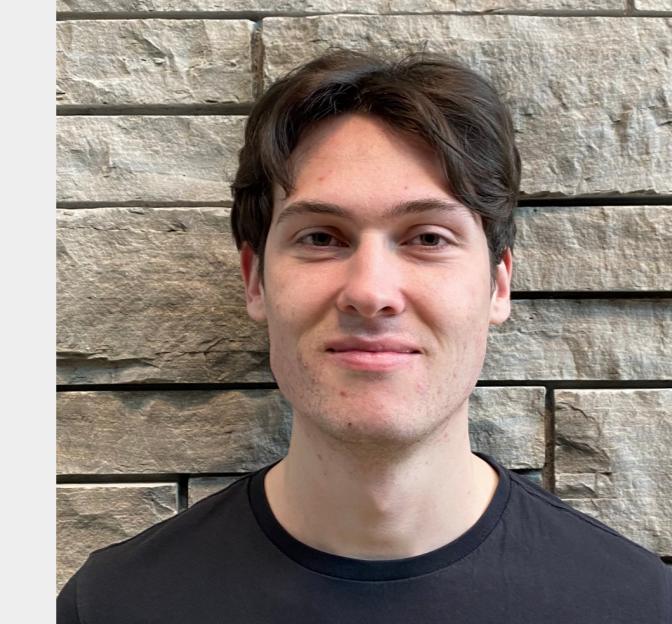
Team



Michael Breau
Software Engineering



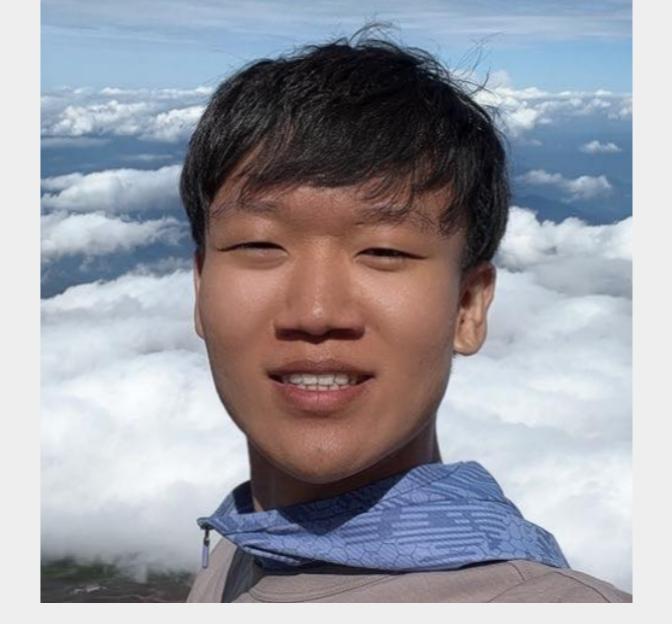
Benjamin Chinnery
Software Engineering



Matthew Curtis
Software Engineering & Management



Jessica Dawson
Software Engineering



Franklin Tian
Software Engineering & Management

Acknowledgements

We would like to acknowledge and thank Dr. Sébastien Mosser (Project supervisor), Diego Maupomé (Research Assistant at Université du Québec à Montréal) and Marie-Jean Meurs (Professor at Université du Québec à Montréal) for their support in system design and development throughout the year.