Nancy Chelaru
Data scientist

An avid explorer of how human and machine intelligence can be harnessed to uncover robust insights and empower decision-making.

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RELEVANT PROJECTS

Machine learning to predict customer churn [Streamlit web app] ↗
- Integrates unsupervised clustering, in R, and random forest classification, in Python, to predict customer churn for a typical telecommunications company
- Calculates permutation feature importance to identify factors most associated with customer churn, for devising targeted retention strategies

Association rule mining [Shiny Dashboard] ↗
- Presents a full workflow, in R, for exploring patterns of co-occurrence in datasets
- Uncovers significant relationships between customer demographics and purchasing behaviours that can be used to inform sales and marketing decisions

Survival analysis [Streamlit web app] ↗
- An interactive introduction to the background concepts and workflow of analyzing time-to-event data, in Python
- Employs the Kaplan-Meier estimator and Cox regression model to evaluate time-variant effects of factors influencing customer turnover

Factor analysis of mixed-type data [Flexdashboard] ↗
- A guide to using the principal component method, in R, to characterize relationships among features and individual observations in a dataset
- Derives actionable insights from examining associations between customer characteristics and hierarchical clustering of customers

Dynamic sales dashboard [Plotly Dash] ↗
- An interactive display of daily and historical sales and marketing information for a typical international online retail business

Data science podcast explorer [Shiny web app] ↗
- A web player for exploring and listening to the latest podcasts about data science, machine learning and big data, with recommendations based on topic of interest
- Powered by a Heroku PostgreSQL database that is updated daily via a scheduled job

Receipt and sales flyer tracker [Shiny web app] ↗
- Records purchases through optical character recognition (OCR) or manual entry of shopping receipts
- Summarizes spending patterns in a live dashboard to better inform personal financial planning
- Provides interface to browse and search sales flyers in the Greater Toronto Area

Analysis of data science topic trends on Medium.com [Flexdashboard] ↗
- An interactive explorer of the most commonly appearing word pairs in the titles of all data science articles published on Medium.com between 2009 and November 2019, to provide insights into changing topic trends over time
- The article metadata were collected using the Scrapy web crawling framework, and natural language processing of the titles was conducted using NLTK and spaCy

Interactive SQL tutorial [Shiny web app] ↗
- A platform to learn and practice SQL operations on an in-memory PostgreSQL database

Annotation of gene expression profile in the freshwater pond snail central nervous system ↗
- Unpublished work as part of international collaboration to establish a reference molecular database for this neuroscience model organism
- Assembly and comparative analyses were performed using a variety of Bash, Perl, Python and R scripts on a computing cluster

TECHNICAL SKILLS

Python
pandas, scikit-learn, Plotly, Scrapy

R
dplyr, ggplot2, arules, survival, rvest

SQL
PostgreSQL, MySQL, SQL Server

Web frameworks
Shiny, Plotly Dash, Django

Microsoft Office Suite
Word, Excel, PowerPoint

SOFT SKILLS

Quick learner   Self-directed

Critical thinker   Results-oriented

Enthusiastic collaborator

EDUCATION

Honours Bachelor of Science
University of Toronto

2009 – 2013

Disciplines:
- Neuroscience Specialist, Minors in Physiology and Psychology

PhD program
University of Toronto

2015 – 2018

Department of Physiology
- Completed all degree requirements except for dissertation

AWARDS

The Treble Gold Medal (2013)
Victoria College, University of Toronto
- Awarded to a female student graduating with high overall A standing who has completed a Specialist Program

Canada Graduate Scholarship - Doctoral Program (2016 – 2018)
University of Toronto
- Awarded through national competition by the Natural Sciences and Engineering Research Council of Canada (NSERC)