

Rory McGrath

PERSONAL DATA

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WORK EXPERIENCE

2015 - CURRENT	<p>Software Developer, CAPITA IB SOLUTIONS</p> <p>The work here involves developing modules that extend the functionality of the companies existing Back-End framework along with developing bespoke applications for specific clients.</p> <p>Modules are created for the framework with an emphasis on generics allowing for greater generalization of code applications. Examples of these modules include a Correspondence Module to process and track correspondence, a Dynamic Wizard Module to allow for the creation of dynamic wizards and a Dynamic Table Module that allows for tables to be created and populated independent of database type, view type or table. These modules are created following test driving development using Maven to control dependencies and both unit and integration tests. Revision control is achieved via SVN.</p> <p>Front-End Software is also developed to the specification of clients. Here code is developed to a strict specification with the appropriate unit testing, double testing and code reviews being performed. All code is developed in Java. Similar to the modules above the version control used is SVN with builds, testing and dependencies being handle by a combination of Ant and Maven.</p>
2014-2015	<p>Graduate Researcher (MACHINE LEARNING), THE UNIVERSITY OF CALIFORNIA BERKELEY</p> <p>This work built on the previous research I performed in NCG. During this research a data-driven generative model of a social network in a city was created which took both mobility and social context into account. This work involved the development of the code for the model, data acquisition and on-line visualizations using Python and JavaScript. Large datasets were obtained and maintained in MongoDB, Neo4j and MySQL. The publication for this work is referenced below.</p>
2012-2014	<p>Graduate Researcher (MACHINE LEARNING), NATIONAL CENTER OF GEO-COMPUTATION (NCG) MAYNOOTH UNIVERSITY</p> <p>This work involved researching various models for predicting human movement. Here cellphone data of users was obtained and predictive models were created to determine where individuals would most likely be located at any given time during the day. Predictions were performed using various configurations of SVNs, Logistic Regression, Neural Networks and Decision trees. These models were created using the Python Numpy package and visualized using a combination of the python and JavaScript. Publications during this time are provided below.</p>

EDUCATION

2010-2011	<p>Masters in ARTIFICIAL INTELLIGENCE Edinburgh University Thesis: "Learning to recognize fish." Advisor: Prof. Robert FISHER</p>
2005-2009	<p>Bachelor of ELECTRONIC AND COMPUTER ENGINEERING National University of Ireland, Galway Thesis: "Bluetooth enabled mobile robot." Advisor: Prof. Liam KILMARTIN</p>

COMPUTER SKILLS

Programming Knowledge:	PYTHON, JAVA, JAVASCRIPT, MATLAB, HTML, CSS
Database Knowledge:	MONGODB, NEO4J, POSTGRESQL
Editors & Environment:	VIM, IPYTHON, L ^A T _E X, GIT, LINUX, AWESOMEWM

PROJECTS

“Exploring the Twitch network”

This work looks at exploring and visualizing the Twitch network of broadcasters and followers. Data is obtained using the Twitch api and an interactive graph of broadcasters and followers is created. The preferential attachment model is applied to the network to predict the probability of a new viewer observing any given broadcaster.

“Personal Recommender: Location inference and restaurant recommendation”

This work looks at making personalized restaurant recommendations for an individual by taking their home and work locations into account and weighting based on the users sensitivity to distance to travel, cost and user rating. This project can be divided into two parts. The first deals with inferring the home and work locations by looking at a users Twitter history. The second deals with generating personalized recommendations for restaurants based on the users location and their sensitivity to travel distance, cost and restaurant rating. The results of this work present a potential approach to tackling the cold start problem for recommendation problems.

“Lottery: Is it truly uniform?”

Is the lottery truly random or is there some sort of pattern to it? Are all the balls truly equal in size shape and weight? Some balls have two numbers others have only one. Does this affect the weight or shape and bias the ball in any way? My prior belief is that the lottery is random and balls are drawn from a uniform distribution, however I would like to statistically verify this. For this project I look at the previous seven years of Irish lottery results to show that the balls are all drawn from a uniform distribution.

PUBLICATIONS

- URBCOMP 2014 **The 3rd International Workshop on Urban Computing**
Title: “A generative model of urban activities: simulating a population”
| Author: 1st
This paper presents a data-driven generative model of a social network in a city. It takes both mobility and social context into account by building a generative process of establishing social connections that is governed by latent profiles of city dwellers.
- PERVASIVE 2012 **Nokia Mobile Data Challenge Workshop**
Title: “Habitualisation: Localization without location data” | Author: 1st
Presented a poster showing the results of predicting a users location in a city based on their habits and idiosyncrasies. We looked at predicting a users location using the SVM, MCSVM and HMSVM techniques
- PERVASIVE 2012 **PURBA-2012 Workshop**
Title: “Stratification structure of urban habitats” | Author: 3rd
This paper explored the community structure of a network of significant locations in cities as observed from location-based social network data. We show that particular areas in cities stratify into distinct “habitats” of frequently visited locations, featuring both spatially overlapping and disjoint regions.

INTERESTS AND ACTIVITIES

- **COMPETITIVE PROGRAMMING:** I compete in various programming competitions such as ‘Google Code Jam’ working though example questions found on sites like Topcoder, CodeEval and ProjectEuler.
- **MACHINE LEARNING:** Further developing my interest in Machine Learning, I attend on-line courses and complete personal projects with a focus on prediction, classification and visualizing data.
- **AUTONOMOUS ROBOTICS:** Building and programming simple autonomous robots using a combination of the Raspberry Pi and Python.

REFERENCES

AVAILABLE UPON REQUEST.