

# RORY McGRATH

## PERSONAL DATA

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## WORK EXPERIENCE

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- 2015 - CURRENT | SOFTWARE DEVELOPER, CAPITA IB SOLUTIONS
- THIS WORK INVOLVES UTILIZING JAVA AND SQL TO DEVELOP CUSTOM COMMERCIAL WEB BASED APPLICATIONS. APPLICATIONS ARE DEVELOPED VIA TOMCAT WITH BUILDS BEING MANAGED THROUGH ANT. DEVELOPMENT IS DONE IN AN AGILE ENVIRONMENT USING TEST DRIVEN DESIGN. SVN IS USED FOR VERSION CONTROL. RESPONSIBILITIES INCLUDE, 1) DESIGN AND DEVELOPMENT OF THE JAVA CODE, 2) CREATING, MAINTAINING AND OPTIMIZING THE SQL DATABASES VIA INDEXES, VIEWS AND STORED PROCEDURES, AND 3) CREATING ANT SCRIPTS FOR AUTOMATED ENVIRONMENT SETUP AND DEPLOYMENT.
- 2012-2014 | GRADUATE RESEARCHER MACHINE LEARNING, THE UNIVERSITY OF CALIFORNIA BERKELEY, NATIONAL UNIVERSITY OF IRELAND MAYNOOTH
- THIS WORK INVOLVED RESEARCHING VARIOUS MODELS FOR PREDICTING HUMAN MOVEMENT. 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. A GENERATIVE PROCESS WAS BUILT THAT ESTABLISHED SOCIAL CONNECTIONS WHICH WERE GOVERNED BY LATENT PROFILES OF CITY DWELLERS. ADDITIONAL PROJECTS INCLUDED, 1) DEVELOPING A PERSONALIZED RESTAURANT RECOMMENDATION SYSTEM FOR INDIVIDUALS TAKING THEIR HOME AND WORK LOCATIONS INTO ACCOUNT AND WEIGHTING BASED ON THE USERS SENSITIVITY TO DISTANCE TO TRAVEL, COST AND USER RATING, 2) INFERRING HOME AND WORK LOCATIONS BY LOOKING AT A USERS TWITTER HISTORY, 3) PREDICTING A PHONE USES LOCATION IN A CITY BASED ON NON-SPATIAL FEATURES. RESPONSIBILITIES INCLUDED 1) DEVELOPMENT OF ALL CODE FOR MODEL CREATION, DATA ACQUISITION AND ON-LINE VISUALIZATIONS USING PYTHON AND JAVASCRIPT, 2) OBTAINING, MAINTAINING AND UPDATING LARGE DATASETS USING VARIOUS API CALLS AND VARIOUS DATABASE TYPES. THE DATABASE WERE STORED IN EITHER MONGODB, NEO4J OR SQL, DEPENDING ON THE APPLICATION. 3) RESEARCHING EXISTING TECHNIQUES AND METHODOLOGY AND APPLYING THEM TO THIS FIELD.
- SUMMER 2010 | RESEARCH ASSISTANT NATIONAL UNIVERSITY OF IRELAND GALWAY
- THIS WORK INVOLVED CREATING VARIOUS BLUETOOTH APPLICATIONS FOR MOBILE PHONES USING J2ME. RELIABLE HANDSHAKING PROTOCOLS WERE CREATED BETWEEN A PHONE (J2ME) AND A SERVER (C++). RESEARCH IN VARIOUS BLUETOOTH HANDS FREE PROTOCOLS WAS CONDUCTED AND THE RESULTS WERE INCORPORATED INTO THE MOBILE APPLICATIONS.

## EDUCATION

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2010-2011 MASTERS IN ARTIFICIAL INTELLIGENCE, **Edinburgh University**  
THESIS: "LEARNING TO RECOGNIZE FISH." | ADVISOR: PROF. ROBERT FISHER

2005-2009 BACHELOR OF ELECTRONIC AND COMPUTER ENGINEERING **National University of Ireland, Galway**  
THESIS: "BLUETOOTH ENABLED MOBILE ROBOT." | ADVISOR: PROF. LIAM KILMARTIN

## COMPUTER SKILLS

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PROGRAMMING KNOWLEDGE: JAVA, PYTHON, JAVASCRIPT, MATLAB, HTML, CSS  
DATABASE KNOWLEDGE: MONGODB, NEO4J, POSTGRESQL  
EDITORS & ENVIRONMENT: VIM, IPYTHON,  $\LaTeX$ , GIT, LINUX, AWESOMEWM

## PROJECTS

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### “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 A 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 NEW AND NOVEL 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

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### URBCOMP 2014 **The 3rd International Workshop on Urban Computing**

TITLE: “A GENERATIVE MODEL OF URBAN ACTIVITIES: SIMULATING A POPULATION” |  
AUTHOR: 1<sup>ST</sup>

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: 1<sup>ST</sup>

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: 3<sup>RD</sup>

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

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- **VIRTUAL REALITY:** I HAVE A KEEN INTEREST IN VR AND THE EMERGING DEVELOPMENTS IN THIS FIELD. THIS LEAD ME TO BE AN EARLY ADOPTER OF THE HTC VIVE AND AM CURRENTLY EXPLORING THE CREATION OF SMALL VR ENVIRONMENTS USING BOTH UNITY AND THE UNREAL ENGINE
- **ANDROID DEVELOPMENT:** I STARTED A WEEKLY MEETUP FOR GROUP DEVELOPMENT OF ANDROID APPLICATIONS. ALL CODE IS MANAGED VIA GIT AND IS OPEN SOURCE.
- **ARCHERY, SWIMMING AND SURFING:** THESE ACTIVITIES ARE PREFORMED IN AN EFFORT TO MAINTAIN PHYSICAL FITNESS.

## REFERENCES

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AVAILABLE UPON REQUEST.