

# DR OWEN SIMS

## PERSONAL INFORMATION

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## WORK EXPERIENCE

*Technology  
Development Lead*

2020-Present            PRICEWATERHOUSECOOPERS (PwC)

Currently work within the Office of the CTO (Chief Technology Officer) where I lead technology development within *PwC Operate*; a 4,000 employee business that delivers managed services to UK Government and corporate clients across a range of industries such as finance, energy, and pharmaceuticals.

Current responsibilities include:

- writing governance structures and defining best practices for the development of innovative technologies used internally and within client engagements
- actively participating in technology Communities of Practice and working with the global PwC firm to create a “golden stack” of technologies that are used to deliver client projects
- developing training programmes and career progression pathways in the use of golden stack of technologies for all PwC Operate employees
- introducing Generative AI technologies—such as ChatGPT and Google Bard—into the PwC Operate business
- providing hands-on technical development of solutions, such as:
  - *Resource Management Platform*. Used throughout the Operate business to understand the people and skills available to allocate to client projects, the availability of resources throughout the firm, what projects people are booked on, and the financial impact of hiring, promoting and winning / losing client work
  - *Customer Relationship Management (CRM) Application*. Flexible technology used internally and on client engagements to both handle cases and maintain and track relationships with clients / customers
  - *Engagement Reporting Application*. Web application used on all client engagements to provide updates on features such as their RAG status, resource utilisation, and chargeability

**Achievements.** The technical solutions I developed have improved the efficiency of responding to clients, appropriately allocating resources to projects, and have given stakeholders more visibility on the status of hundreds of projects.

*Artificial  
Intelligence (AI)  
Lead*

Primary objective was to establish and lead the AI practice; a new offering within the Operate business. The purpose of the practice is to research and develop new technologies that can utilise AI to drive automation and efficiency.

Responsibilities included:

- establishing, building, and integrating the AI practice into the core digital offering of the global PwC firm
- leading a team of over 20 developers, project managers, and business analysts to develop tools for clients both internally within the global PwC firm and externally of the firm
- engaging and managing relationships directly with clients and stakeholders. Clients included UK Government bodies and firms in a range of industries and across a range of sizes

- maintaining a hands-on role in the development and delivery of projects and training new members of the team in AI tools and technologies
- promoting and actively forming strategic partnerships with other technology firms that could assist with the adoption and development of AI solutions

**Achievements.** I established and built the AI practice, making it a profitable and self-sustaining offering for Operate. The practice continues to work with significant clients, such as two of the UK's largest banks.

#### 2018-2020 THE CENTRE FOR SECURE INFORMATION TECHNOLOGIES (CSIT)

*Principal Software Engineer*

Led the development and co-ordination of more than 40 projects supporting the London Office for Rapid Cybersecurity Advancement (LORCA).

Responsibilities included:

- providing hands-on engineering effort and technical expertise on projects for early-stage cyber security companies
- projects involved developing:
  - an efficient Java-based Autoregressive Integrated Moving Average (ARIMA) model
  - a Scala API integration with W2Global and RM Integris databases
  - a Python-to-C wrapper to dynamically send rulesets to the Linux-based extended Berkeley Packet Filter
- communicating directly with clients to initiate projects by understanding and refining the scope of the projects, the clients' timeframe, and what can reasonably be achieved
- project planning and execution done within an Agile methodology, regularly preparing, updating and reviewing the agreed scope and overall deliverable being worked on within each corresponding project and team

**Achievements.** Leading a team of software developers and data scientists I successfully delivered over 40 projects to start-ups across the UK.

#### 2018-2020 CONFEDERATION OF BRITISH INDUSTRY (CBI)

*Senior Policy Advisor*

Joined as an Economist, leading multi-disciplinary teams based in Belfast and London to investigate the impact of the UK's Exit from the EU on the Northern Ireland (NI) economy.

Promotion to Senior Policy Advisor entailed:

- working with academics, industry, and UK Government departments across the UK and internationally to develop Computational General Equilibrium models that represent the dynamics of the Northern Irish economy
- facilitating UK Government policy-makers to better understand the economic and social impact of social and economic policies during and after the UK's EU exit
- developing policy and directly advising UK Government by gathering data, empirical industry evidence, and developing software that can support economic policy and inward investment initiatives for regional NI growth
- understanding the distribution of expertise across the teams and collaborators to allocate resources across projects

**Achievements.** Throughout working with the CBI I was asked to deliver policy recommendations and communicate research findings to Prime Ministers Boris Johnson and Theresa May, senior Members of Parliament such as Michael Gove and Sajid Javid, multiple Secretaries of State for Northern Ireland, Senior Civil Servants, and highly influential business people. These recommendations and briefings led to substantial changes to Government policy on migration, technology, and skills investments.

#### 2016-2018 CYBERLYTIC

*Lead Data Scientist*

Joined as a Technical Lead to create a machine-learning powered web

application security monitor and firewall, the Profiler.

Responsibilities included:

- developing bespoke anomaly detection, classification and deep-learning methods to detect and triage malicious activity.
- conducting research used to win contracts with the Ministry of Defence (MoD) to develop mission planning applications that use AI to support a commanders decision-making process on the field
- presenting and communicating new research across the firm and directly to clients
- hiring and managing a growing team of engineers and data scientists.
- managing and developing the MoD software applications.
- utilising project management tools—such as Jira, Confluence and Trello—to develop each projects' roadmap, informing all user stories that needed to be completed, and allocating people and time to each deliverable.
- providing coaching to junior members of staff.

**Achievements.** My role was acknowledged as being critical in researching and developing multiple machine-learning applications. I led all research within the firm that ultimately won MoD contracts and led to marketable innovations.

#### 2010-2016 QUEEN'S UNIVERSITY MANAGEMENT SCHOOL

*Module  
Coordinator &  
Lecturer*

Coordinated and fulfilled lecturing and tutorial duties for Advanced Microeconomics (Year 3 Economics), Mutual and Pension Fund Management (Year 2 Finance and Actuary) and Advanced Business Economics (Year 3 Economics) modules. Facilitated each students pursuit of the development of innovative ideas by giving them extra lecture and coaching hours. Student evaluation average: 4.77/5.

*T.A.*

Teaching Assistant for Principles of Economics (Year 1 Economics), Microeconomics (Year 2 Economics), Labour Economics (Year 3 Economics), Advanced Microeconomics (Year 3 Economics), Econometrics (Year 3 Economics and Finance) and Executive MBA (postgraduate).

#### 2011 SHENZHEN UNIVERSITY

*Lecturer*

Economics and Mathematics Lecturer over the course of a semester for the Normal College of Shenzhen University, China. This was done in conjunction with Queen's University Belfast.

### TECHNICAL SKILLS

*Languages*

PYTHON, R, JAVA, LUA, SQL, JAVASCRIPT, HTML+CSS, MATLAB, STATA, RUST, SCALA, L<sup>A</sup>T<sub>E</sub>X

*Technologies*

MONGODB, HADOOP, ELASTICSEARCH, POSTGRESQL, REDIS, DJANGO, FLASK, SPRING, REACT, ANGULAR, ANGULARJS, TENSORFLOW, D3, DOCKER, KUBERNETES, NGINX, JENKINS, TRAVIS CI, GCP, AWS, OXMETRICS, MATHEMATICA, GIT, MICROSOFT OFFICE, GOOGLE DOCS, PHOTOSHOP

*Project  
management*

JIRA, TRELLO, GITHUB, GITLAB, CONFLUENCE, BITBUCKET, MICROSOFT TEAMS

### EDUCATION

#### 2011-2016 QUEEN'S UNIVERSITY BELFAST

*Ph.D. in  
Economics*

Thesis: *Entrepreneurship and Wealth Generation in Socially Structured Economies*  
This monograph uses insights from graph theory and algorithmic game theory to develop a model of entrepreneurship and wealth-creation given a relational perspective of economic interaction.

Advisors: Professor Robert P. GILLES & Dr Graham BROWNLOW

*Masters in  
Economics (M.Sc.)*

2010-2011

QUEEN'S UNIVERSITY BELFAST

Distinction · School: Queen's Management School  
Thesis: *A Theory of Entrepreneurship in Networked Economies*  
Modules and Topics: Money and Banking, Macroeconomics, Microeconomics, Game Theory, Institutional Economics, Econometrics, Labour Economics.  
Advisor: Professor Robert P. GILLES

*Bachelors in  
Economics (B.Sc.)*

2007-2010

QUEEN'S UNIVERSITY BELFAST

First Class Honours · School: Queen's Management School  
The degree programme combined both empirical and theoretical insights into complex issues regarding labour markets, environmental economics, economic development, financial crises and econometrics.

ARTICLES

ACCESSIBLE LABOUR & REGIONAL ECONOMIC PROSPERITY

Citing NI's demographic challenges, alongside the persistent exodus of young people to study and work outside the region, the article demonstrates the dependence of NI employers on a steady inflow of international workers.  
Author: Owen SIMS

CRITICAL NODES IN DIRECTED NETWORKS

A measure is constructed to calculate the positional power of nodes depending on their ability to disrupt trade. A mathematical duality is formed between power and the economic notion of contestability.  
Authors: Owen SIMS, Robert P. GILLES

BUILDING BLOCKS: EXTRACTIVE STRUCTURES IN NETWORKS

We provide a measure network thickness, which is associated with its robustness and competitiveness. We construct a game where agents attain network power by forming partnerships with others to reduce thickness.  
Authors: Owen SIMS, Robert P. GILLES

ON CASCADES, VACCINATION AND STIGMATISATION

We model cascading phenomena, provide measurements of each nodes impact, and derive efficient vaccination methods. Applied to interbank loan market.  
Authors: Owen SIMS, Robert P. GILLES

OTHER INFORMATION

*Projects and  
Auxiliary Work*

Present · Board member of the Belfast City Economic Forum, established to review the use of funds from the *Belfast Region City Deal*.

Present · Advisory board member of the Department for Economy's *Project Stratum*, advising Government on the roll-out of ultrafast broadband and 5G technology throughout Northern Ireland.

Present · Developed Python/Angular4 application that collects NI property data to detect and report price imperfections: [github.com/O1sims/Sukasa](https://github.com/O1sims/Sukasa).

2018 · Economic consultant for the CBI to investigate the impact of NI migration post-Brexit: [github.com/O1sims/MigrationNI](https://github.com/O1sims/MigrationNI).

2017 · Created blockchain messaging application: [github.com/O1sims/Koala](https://github.com/O1sims/Koala).

2017 · Developed the *networkR* package for R that performs statistical analysis on networks and hypergraphs: [github.com/O1sims/networkR](https://github.com/O1sims/networkR).

2016 · Created Java/AngularJS web application that collects, stores and visualises Northern Irish economic data: [github.com/O1sims/EcoNI](https://github.com/O1sims/EcoNI).

2012–2016 · Queen’s Management School Ph.D. committee founder.

2011–2014 · TEDx Belfast co-organiser.

2009–2011 · Volunteer and Campaigner for Oxfam FairTrade.

#### *Grants and Awards*

2011 · DEL Ph.D. Scholarship · Four year funding for undertaking a Ph.D.

2011 · Oxford Economics Award · Best Dissertation in M.Sc. Economics

2010 · McKane Medal for Jurisprudence and Political Economy · Best final honours student in B.Sc. Economics

2009 · Shaw Memorial Prize · Best performing Year 2 student in Economics

#### *Presentations*

2018 · *The Impact of Brexit on the Northern Irish Economy*, By invitation from Agenda Northern Ireland.

2017 · *Joint User Mission Planning*, By invitation from Rapid Reaction Technology Office (RRT0), Department of Defence.

2016 · *Modelling Attack-Defence Games on a Network-Geographic Topology*, By invitation from Defence Science and Technology Laboratory (DSTL). Corresponding paper available at: <http://bit.ly/attack-defence-games>

2016 · *Predicting Risk in Missions with Cyber-Physical Assets*, By invitation from Defence Science and Technology Laboratory (DSTL).

2016 · *Critical Nodes in Directed Networks*, By invitation from East Anglia University (with Prof. Robert P. Gilles).

2015 · *Building Blocks: Extractive Structures in Networks*, Workshop on Games and Networks, QUB.

2011–2016 · Routine technical and non-technical presentations at internal seminars to academics and students at Queen’s Management School.

2014 · Presented in TEDx Cathedral Quarter. Title: Banking 2.NO!

2010 · Non-technical presentations to RSPB management regarding the economic impact of wildlife sanctuaries.

#### *Interests*

Economic history · Hiking · Travelling

Last updated: June 28, 2023