Dr Sen **Hu**

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Apartment 19, Madison Court, Grattan Street, Dublin 2, D02 YF78, Ireland

Skills

Data science
Machine learning
Deep learning
Multivariate analysis
Time-series analysis
Maximum likelihood
Sampling methods
MCMC
Hypothesis testing
Natual language processing
Experimental design
Data visualization

Programming
R | 10+ yrs
Python | 5+ yrs
git | 4+ yrs
SAS | 2+ yrs
bash | 2+ yrs
R shiny | 3+ yrs
Tableau | 2+ yrs

Database
MySQL | 3+ yrs

Languages
English (fluent)
Mandarin (native)
French (elementary, DELF certified)

Education

Ph.D. Statistics, University College Dublin, Ireland 2015–2019
Thesis: *Predictive Analytics with Clustering and Dependence Modelling for Insurance Pricing*
M.Sc. Statistics, Imperial College London, UK 2013–2014
B.Sc. Mathematics, University of Edinburgh, UK 2010–2013

Experience

Senior Data Scientist (AI Production)
Afiniti AI, Dublin, Ireland Mar. 2021–Nov. 2021
- Led a data scientist team on a large-scale Telesales queue in call centre operations for a French client, primarily focusing on predictive modelling in R to pair incoming calls with optimal call centre agents
- Responsible for updating AI models in production, identifying production issues, and problem solving in a high pressure business environment
- Analyzed millions of call centre records to understand trend changes and to monitor abnormalities using MySQL
- Modelled call data from Care & Retention queue to predict customer churn using deep learning modules in Python (Sklearn, Keras, Tensorfolow etc.)
- Trained and guided junior team members on day-to-day tasks
- Collaborated closely with wider teams (production support, client service, system engineer) to ensure production system ran smoothly and to achieve production commercial targets

Freelance Data Scientist (Part-Time)
Self-employed, Dublin, Ireland, and London, UK Jan. 2015–present
- Conducted statistical research with University College Dublin academics on developing novel model-based clustering and regression methodologies, and assisted writing and publishing academic papers (on-going)
- Developed teaching materials for the IFoA Certificate in Data Science for Institute and Faculty of Actuaries, as part of a wider data science team
- Consulted for Smiths Group plc on development of a summer internship programme on data science application, worked with programme managers for project implementation
- Provided statistical consultations for academic and medical researchers in various academic institutes in Dublin and London

Data Scientist (Real World Evidence)
Novartis, Dublin, Ireland Oct. 2020–Mar. 2021
- Conducted observational data analyses using machine learning and statistical programming (clustering, regressions, decision trees, random forest, survival models) on multiple analytical studies investigating melanoma, polycythemia vera, liver/renal transplants respectively
- Used SQL (Apache Impala) to analyze large observational commercial databases (Optum, ConcertAI, MarketScan) for medical cohort extraction and study
- Produced documents on study protocols, statistical analysis plan, analytics reports
- As client-facing project manager, communicated and liaised with clients about project scoping and progress, presented analytical deliverables in non-technical terms to medical professionals; managed and coordinated weekly team tasks, project timelines, and ad-hoc project management tasks
- Organized and chaired weekly wide team meetings and statistics team training sessions

Actuarial Marketing Data Scientist (Post-doctoral Researcher)
Zurich Life Assurance & **Insight Centre for Data Analytics**, Dublin, Ireland Mar. 2020–Aug. 2020
- Analyzed large Zurich insurance data and Irish census data using machine learning (model-based clustering, k-means, logistic regression) in Python for customer segmentation and policy lapse prediction
- Independently identified issues and errors in existing data analysis, corrected within tight timeframes and lead the project in a new direction
- Reported regularly to Zurich directors and published results in international journals
- Mentored two actuarial M.Sc. students' research thesis on COVID19 pandemic impact on customers' behaviours for Zurich in Ireland and copula modelling

Experience (continued)

Module Coordinator, Lecturer & Teaching Assistant
School of Mathematics & Statistics, University College Dublin, Ireland
Beijing-Dublin International College, Beijing University of Technology, China Sep. 2015–Feb. 2020

- Designed module syllabus, delivered original course materials on regression models and statistical inference to classes of approximately 100 students
- Executed module administrative duties, set and graded assignments and degree exams
- As teaching assistant, taught undergraduate and postgraduate tutorials and computer labs of up to 130 students for 11 different modules in the field of statistical machine learning and statistical theory

Insurance Portfolios Data Analyst (Researcher in Statistics)
Aviva Insurance & **Insight Centre for Data Analytics**, Dublin, Ireland Sep. 2015–Aug. 2019

- Developed innovative machine learning approaches (model-based clustering and variable selection) to segment customers across multiple lines of business, and to price multiple lines of business simultaneously, and customers' claim predictions improved more than 10% as results
- Analyzed millions of general insurance policy data in R to better understand customers' claim behaviours
- Worked in a team with Aviva actuaries to identify business-related research questions, coordinated project progress, and interpreted research outcomes for commercial interest
- Reported results monthly to both Aviva directors and Insight managers
- Published research output in top level international conferences and journals, and released developed algorithms as R packages via R CRAN

Medical Data Scientist (Research Assistant in Data Science)
School of Health Science, City, University of London, UK Sep. 2014–Jul. 2015

- Applied machine learning algorithms (PCA, factor analysis, regressions) in Python to eye and health clinical data and survey data collected from different UK NHS hospitals, to understand the relation between glaucoma eye condition and patients' quality of life
- Published research outcomes on international journals
- Collaborated with medical researchers and clinical doctors to interpret analysis findings

Selected Awards, Achievements, Interest

- Science Foundation Ireland (SFI) doctoral scholarship (€124,400), Insight Centre for Data Analytics 2015–2019
- Fellow and Certified Graduate Statistician (GradStat), Royal Statistical Society, UK 2014–present
- Edinburgh Global Mathematics Scholarship (£4,000), the University of Edinburgh 2010–2013
- Edinburgh Award (Volunteering), the University of Edinburgh 2012
- Excellent Achievement Certification (Worldwide) in ACCA F3 Financial Accounting Exam, ACCA UK 2010
- Finance and accounting experience: student of Association of Chartered Certified Accountants, completed 4 modules with excellence: Accountant in Business, Business Law, Financial and Management Accounting 2008–2012
- **Interests**: Frequent traveller, have travelled in East and South East Asia, Europe and North America
  World cinema cinephile; Meditator. Active swimmer and squash player

Selected Data Science Publications (full publication list available on github)

- **Hu, S**, O'Hagan, A, Sweeney, J & Ghahramani, M (2020), "A Spatial Machine Learning Model for Analyzing Customers' Lapse Behaviour in Life Insurance", Annals of Actuarial Science, https://doi.org/10.1017/S1748499520000329
- **Hu, S**, Murphy, TB & O'Hagan, A (2020), "mvClaim: An R Package for Multivariate General Insurance Claims Severity Modelling". Annals of Actuarial Science, https://doi.org/10.1017/S1748499521000099
- **Hu, S** & O'Hagan, A (2020), "What Are You Grouping For: Investigating How Cluster Analysis with Copulas Can Improve Insurance Claims Forecasting", The Actuary, July 2020, https://www.theactuary.com/features/2020/07/08/insurance-claims-forecasting-cluster-analysis
- **Hu, S**, O'Hagan, A & Murphy, TB (2018), "Motor Insurance Claims Modeling with Factor Collapsing and Bayesian Model Averaging", Stat, https://doi.org/10.1002/sta4.180
- **Hu, S**, Smith, N, Saunders. L & Crabb, D (2015), "Patterns of Binocular Visual Field Loss Derived From Large Scale Patient Data From Glaucoma Clinics", Ophthalmology, https://doi.org/10.1016/j.ophtha.2015.08.005

REFERENCES ARE AVAILABLE UPON REQUEST.