JONATHAN CARLTON

jonathancarlton.co.uk

My experience centres on deriving meaning from data, with a focus on understanding and modelling user behaviour through their interactions with online content. I have conducted research from conception to completion, including collaboratively working with BBC R&D to deploy production and lab-scale studies to capture and analyse user interactions, providing crucial insights for BBC content creators, with findings being implemented into production systems.

SKILLS

Python (Primary) & Java (Secondary), SQL & NoSQL (MySQL + PostgreSQL + MongoDB), Data Analysis (Pandas + NumPy + SciPy), Data Visualisation (Matplotlib + Seaborn), Machine Learning (Scikit-Learn + Tensorflow (Keras)), Software Engineering (Version Control + Unit Testing + Continuous Integration)

EDUCATION

University of Manchester (BBC R&D Sponsored), PhD, Computer Science
Manchester, UK │ September 2017 – January 2022 │ Weekdays were mixed between BBC R&D and University of Manchester

Title: Using Data to Understand How Audiences Engage with Interactive Media

Theme: Exploring logs of interaction data to discover predictive features of engagement and abandonment from nationally released media experiences and working collaboratively with BBC R&D to optimise data collection and application of behavioural models.

Goals: To have a positive impact on the user's experience; to inform content creators through data-driven recommendations; and, to provide the BBC with an in-depth picture of the user's experience through interpretable metrics.

ACM Summer School on Recommender Systems
University of Gothenburg, Sweden │ September 2019

Newcastle University, Master of Computing, Computer Science
Newcastle, UK │ 1st class │ September 2013 – July 2017

EXPERIENCE

Postdoctoral Research Associate
University of Manchester, Department of Computer Science │ Febuary 2022 – Present

Leading a project with a start-up to build data pipelines to enable content recommendations based on user behaviour with a mobile app. The app is a work-based e-learning tool used by employees to learn skills relevant to their roles within their company.

Research Assistant
University of Manchester, Department of Computer Science │ July 2021 – Present

Working in collaboration with a fellow PhD student, the project aims to create personalised curations of museum content with data sourced from partner institutions: Manchester and Whitworth Art Galleries, Art UK, and the Smithsonian. To fund the project, we recently applied for and received a research grant from the Alan Turing Institute (£10,000) to fund further research.

The work involves: building an autoencoder and using NLP techniques to extract features from artwork and metadata; building a content-based recommendation model; a web system to serve a personalised exhibition and collect evaluation metrics; and carry out a study to test its effectiveness.

Tools used for the Web Application include: Django; MySQLr; HTML; CS; JavaScript; and for Modelling & Analysis: Tensorflow; Faiss; Gensim; Pandas; SciPy)

Lead Teaching Assistant & Teaching Assistant
University of Manchester, School of Computer Science │ January 2018 – January 2022

Lead Teaching Assistant: Data Engineering (PG) and Java 1 (UG)

Teaching Assistant: Foundations of Machine Learning (PG), Machine Learning & Optimisation (UG), Data Engineering (PG), Java 1 & 2 (UG), Chip Multiprocessors (UG), Database Systems (UG), Modern Information Engineering (PG), and Modelling Data on the Web (PG)

Research Assistant
Newcastle University, School of Computer Science │ May 2017 – July 2017

The project automated a social network to provide ground truth metrics to evaluate a user ranking algorithm developed in my Master's project. The work was part of a collaboration between Newcastle University and Pontifical Catholic University of Rio de Janeiro.

Research Assistant
Newcastle University, School of Computer Science (UK Government Sponsored) │ July 2016 – September 2016

Investigated whether behavioural patterns (social media usage) and topic detection (social media posts) could assist in controlling access to restricted areas of a building. The project involved extracting topics regularly posted about and connections in social networks from social media accounts to evaluate how they changed over time.

RESEARCH ACTIVITIES

Peer-Reviewed Publications

- **Carlton, J**., Brown, A., Jay, C., Keane, J. Using Interaction Data to Predict Engagement with Adaptive Media. *In Proceedings of the 29th ACM International Conference on Multimedia (MM'21).* ACM, 2021
- Nohrer. L., **Carlton, J.**, Jay, C. Machine Learning and Museum Collections: A Data Curation Conundrum. *International Conference on Emerging Technologies and the Digital Transformation of Museums and Heritage Sites* (RISE IMET)*,* Springer, 2021
- **Carlton, J.**, Brown, A., Jay, C., Keane, J. Inferring User Engagement from Interaction Data. *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*. ACM, 2019.
- **Carlton, J.**, Woodcock J., Brown, A., Jay, C., Keane, J. Identifying Latent Indicators of Technical Difficulties from Interaction Data. *ACM SIGKDD Workshop on Data Science, Journalism, and Media* (DSJM 2018), ACM, 2018.

- **Carlton, J.**, Brown, A., Keane, J., Jay, C. Using Low-Level Interaction Data to Explore User Behaviour in Interactive-Media Experiences. *11th International Conference on Methods and Techniques in Behavioural Research.*
- Missier, P., McClean, C., **Carlton, J.**, *et. al.* Recruiting from the Network: Discovering Twitter Users Who Can Help Combat Zika Epidemics. *17th International Conference on Web Engineering (ICWE 2017)*. Springer, Cham.

Academic Activities

Reviewer:
- ACM WWW 2020
- ACM CHI 2021; 2020; 2019
- ICWE 2017

Volunteer:
- ACM RecSys 2021; 2020
- ICML 2020
- ACM SIGIR 2019
- ACM TVX 2019

Supervision:
- Website Development Intern on the Alan Turing Institute funded research (co-supervisor, three months)
- BBC R&D Intern on Data Visualisation for Interaction Data (co-supervisor, three months)

Invited Talks:
- AI Foundry (October 2021)
- BBC R&D (May 2019 & November 2020)
- Data in Media Conference (October 2019)
- Advances in Data Science Conference (May 2018)

INTERESTS

An avid Star Wars fan - attended the Celebration Europe event (2016) and due to attend Celebration 2022 in Anaheim, California. A keen trail runner - challenging myself to run an ultra marathon (or two) in 2022. Music-lover - regularly go to live music events and enjoy seeing my favourite bands whenever they tour.