Gregory J. Clark, Ph.D.

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PROFESSIONAL SUMMARY

Passionate network/graph specialist with proven track record of pioneering novel solutions to computational and modeling problems in financial sector. Co-founder and director of spinout company, Augmented Intelligence Labs, based on algorithm invented for improved long-term social trend forecasting. Leading transformative business processes with scalable network solutions across functional areas including artificial intelligence, machine learning, enterprise data management, enterprise capabilities, and operations. Experienced data science team manager focused on delivering solutions ahead of schedule. Legacy of inventing and utilizing cutting-edge mathematics to solve problems and automate solutions at scale.

- Developed *Data Universe* map of PNC Hadoop and Teradata tables. Invented PNC's first approved network-based model to identify opportunities for data consolidation and cross-team collaboration.
- Achieved unique combination of scientific and entrepreneurial expertise by completing a Ph.D. in Mathematics and embarking on a four-year postdoctoral fellowship at Saïd Business School, University of Oxford.
- Co-founded Augmented Intelligence Labs -- Saïd Business School's first spinout company and fourth spinout within Oxford University's Social Science Division to offer global clients research targeted to meet proprietary needs. Clients include Ernst & Young (EY), Moët Hennessy (LVMH), Kantar Group, Reckitt Benckiser (RB), Nestlé, and Unilever.
- Invented *Hypertrends* algorithm, a key component of Kantar's Issue Radar, which fuels firm level sustainability strategy with an AI-powered trends program, using leading-edge predictive analytics.
- Partnered with International Chamber of Commerce to create Framework for Ethics in AI for the ICC's 45MM business members around the world, which was published on ICC e-commerce platform, ICC Knowledge 2 Go. Top downloaded paper on SSRN for 3 months.
- Teamed with Mars, Inc. to identify systemic discrimination preventing women's inclusion in corporate and community leadership roles. This resulted in "Here to Be Heard Global Listening Study," which incorporated 10K women's viewpoints across 88 countries.

PROFESSIONAL SKILLS

Mathematics | Data Science | Artificial Intelligence | Machine Learning | Network Science Graphical Neural Networks | Automation | High Performance Computing | Risk Analysis Marketing Science | Trend Forecasting | Public Speaking | Complex Problem Solving | Leadership

PROGRAMMING SKILLS

Python | (Py)Spark | Git | Hadoop | Neo4J | Deep Graph Library (DGL) | Grakel | NetworkX TensorFlow | Keras | RapidFuzz | nltk| Powerlaw | xgboost | shap | scipy | scikit-learn

PROFESSIONAL EXPERIENCE

PNC Bank Pittsburgh, PA

Data Scientist Sr. and AVP 2023– Present

- Developing the *Data Universe*, a map of all data assets, to identify opportunities for data consolidation and cross-team collaboration. Coordinated with teams across Technology to create Neo4J instance to store map efficiently. Continuing to develop model to consider data proliferation and data lineage.
- Developing AI Metadata Generation model to improve data findability and improve model development pipeline across the firm.
- Developing Graph Convolutional Network (GCN) using peer-to-peer map of customer transactions to identify risky behavior. Results will feed into downstream anti-money laundering and fraud processes to reduce manual review by investigators.
- Collaborating with Retail Banking and Marketing to create Customer Journey model to reduce customer churn by quantifying the effect of pain points and optimizing an intervention strategy for maximizing lift and retention.
- Managing team of data scientists on cross-functional project to create behavioral segments of customers as an input for fraud and marketing decisioning models.

Augmented Intelligence Labs Oxford, UK

Co-Founder, Inventor, and Managing Director 2020-Present

- Co-founded Saïd Business School's first spinout company, which uses mathematical research to identify issues and solutions to key business and social challenges such as managing corporate growth, market positioning, forecasting, business analysis, and applying AI techniques. Worked with 6 multinational corporate clients.
- Invented Hypertrends algorithm that is foundational to Kantar's Issue Radar Platform and has been used to inform strategy and practice at Ernst & Young (EY), Moët Hennessy (LVMH), Kantar Group, Reckitt Benckiser (RB), Nestlé, and Unilever.
- Integrated cutting-edge *Hypertrends* algorithm with marketing theory to yield measurable, verifiable, and actionable answers to business questions while facilitating long-term, mid-range, and short-term planning. Worked directly with corporate data scientists to implement algorithms into data pipeline.

University of Oxford, Saïd School of Business Oxford, UK

Post-Doctoral Research Fellow in Marketing and Reputation 2019 – 2023

- Conducted mathematical research in social networks and business analytics. Published independent and coauthored peer-reviewed research in top mathematics journals.
- Met regularly with industry partners such as Google, Meta, and Twitter. Applied mathematics to solve business problems and develop measurable and verifiable mathematical answers to proprietary and strategic questions.
- Built lasting relationships with executives while championing application of mathematics and data science to answer questions relating to long-term marketing goals, social responsibility, and business strategies.
- Collaborated with enterprises to develop external commissioned reports, proprietary strategies, data, algorithms, theorems, presentations, and workshops.

EDUCATION

Ph.D. in Mathematics, May 2019
University of South Carolina, Columbia, SC

Bachelor of Science in Mathematics, May 2014
Westminster College, New Wilmington, PA

Budapest Semesters in Mathematics, Spring 2013
Budapest, Hungary

French Language and Culture Immersion Program, Summer 2012
Institute de Catholique de Paris, Paris, France

SELECTED PUBLICATIONS

1. Gregory J. Clark, Felipe Thomaz, and Andrew Stephen. Comparing the principal eigenvector of a hypergraph and its shadows. *Linear Algebra and its Applications,* 673:46-48, 2023.
2. Gregory J. Clark. Comparing eigenvector and degree dispersion with the principal ratio of a graph. *Linear and Multilinear Algebra,* 72(2), 188–202, 2022.
3. Gregory J. Clark and Joshua N. Cooper. Applications of the Harary-Sachs Theorem for Hypergraphs. Linear Algebra and its Applications, 649:354-374, 2022. 8. Gregory J. Clark and Joshua N. Cooper. A Harary-Sachs Theorem for Hypergraphs. *Journal of Combinatorial Theory, Series B*, 149:1–15, 2021.
4. Gregory J. Clark and Joshua N. Cooper. Adjacency Spectral Theory for Uniform Hypergraphs, *IMAGE (Bull Lin. Alg. Soc.),* 62 (2019), pp. 7-19.
5. Gregory J. Clark and Joshua N. Cooper. Stably computing the multiplicity of known roots given leading coefficients. *Numer Linear Algebra Appl.,* 2020; 27:e2275.
6. John Asplund, Eva Czabarka, Gregory J. Clark, et al. Using block designs in crossing number bounds. *J Combin Des.,* 2019; 27: 586-597.
7. Gregory J. Clark and Joshua N. Cooper. On the Adjacency Spectra of Hypertrees, *Elec. J. Comb.,* 25 (2018), no. 2, pp. 2-48. 3.
8. Gregory J. Clark and Gwen Spencer. New Bounds on the Biplanar Crossing Number of Low Dimensional Hypercubes. *Bulletin of the Institute of Combinatorics and its Applications (BICA),* 83(2018), 52-60.