Ivan Brugere

Research Scientist - AI For Good

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Current Objective

I am currently seeking machine learning research scientist positions in industry, available in January 2020.

I focus on machine learning research and applications for social good. My current reasearch focuses on explainability and fairness, especially in complex domains such as graphs. I am also interested in model reduction for on-device and other low-resource environments. My PhD research focused on data science methodologies for inferring and validating graphs constructed from underlying data, with applications in interdisciplinary computational ecology, mobile location privacy, and large-scale multimedia recommendation.

Employment

Jan. 2019- **Salesforce Research** Research Scientist - AI For Good
Developing novel AI research and deployed services for Salesforce not-for-profit customers.

Summer 2018 **Amazon** Applied Scientist Intern (Mentor: Alex Smola)
Designed deep learning graph APIs on MXNet. Focused on structured computational models on graphs, and scalability. Part of the Amazon Web Services AI Platforms team.

Summer 2015 **Microsoft** Data Science Intern (Mentor: Marcello Hasegawa)
Developed textual and device models for novelty detection and attribution in the Windows 10 user population.

Summer 2014 **Lawrence Livermore National Laboratory** Research Intern (Mentor: Brian Gallagher)
Formulated graph inference problems over several scientific research domains. Part of the Cyber Defenders internship program.

2013-2015 **University of Illinois at Chicago** Research Fellow (Mentor: Prof. Venkat Venkatakrishnan)
Graph-based models for attribute inference and privacy preservation on real mobile device datasets.

Summer 2013 **Technicolor Research** Research Intern (Mentor: Brian Eriksson)
Rule discovery for biometric sensor time series data for actionable analysis of film audiences. Developed methods to discover and visualize dynamic audience communities.

2012-2017 **University of Illinois at Chicago** Research Assistant (Advisor: Prof. Tanya Berger-Wolf)
Model selection for graph structure inference and prediction. Focusing on ecology and populations biology domains.

2010-2012 **University of Minnesota** Research Assistant (Advisor: Prof. Vipin Kumar)
Time series change detection and anomaly detection on large remote sensing datasets. Focused on incorporating spatial aspects for change significance testing, and domain-driven information retrieval.

2004-2007 **University of Minnesota** Web Applications Developer (Department of Computer Science)

2002-2003 **University of Minnesota** Web Applications Developer (College of Liberal Arts)

Education

2012- **University of Illinois at Chicago** Computer Science PhD (Advisor: Prof. Tanya Berger-Wolf)
Thesis: Network Structure Inference: Methodology and Applications.

2009-2012 **University of Minnesota** Computer Science M.S. (Advisor: Prof. Vipin Kumar)
Thesis: Approximate Search on Massive Spatiotemporal Datasets.

2007-2009 **The New School** International Affairs M.A.

2002-2007 **University of Minnesota** Computer Science B.S., Cultural Studies B.A.

Organizing

Tutorials

2019 Fairness in Machine Learning – A Hands-On Tutorial I. Brugere, A. Karpatne (ACM Tapia Conference)

2018 Modeling Data with Networks + Network Embedding: Problems, Methodologies and Frontiers
I. Brugere, B. Perozzi, P. Cui, W. Zhu, J. Pei, T.Y. Berger-Wolf (KDD 2018)

Workshops

2019 PhD Forum (IEEE ICDM'19)

2017 NetInf'17: First Workshop on Inferring Networks from Non-Network Data (SIAM SDM'17)

2016 Inferring Networks from Non-Network Data (SIAM AM'16)

Publications

2018 Network Structure Inference, A Survey: Motivations, Methods, and Applications
I. Brugere, B. Gallagher, T. Y. Berger-Wolf (ACM Computing Surveys)
Network model selection with task-focused minimum description length
I. Brugere, T.Y. Berger-Wolf (WWW BigNet Workshop on Learning Representations for Big Networks)
Coordination Event Detection and Initiator Identification in Time Series Data
C. Amornbunchornvej, I. Brugere, A. Strandburg-Peshkin, D. Farine, M.C. Crofoot, T.Y. Berger-Wolf (ACM TKDD)

2017 Evaluating Social Networks Using Task-Focused Network Inference
I. Brugere, C. Kanich, T.Y. Berger-Wolf (SIGKDD MLG Workshop on Mining and Learning in Graphs)
A General Framework for Task-Oriented Network Inference
I. Brugere, C. Kanich, T.Y. Berger-Wolf (SIAM SDM Workshop on Inferring Networks from Non-Network Data)

2016 Both Nearest Neighbours and Long-term Affiliates Predict Individual Locations During Collective Movement in Wild Baboons
D. Farine, A. Strandburg-Peshkin, T.Y. Berger-Wolf, B. Ziebart, I. Brugere, J. Li, M. Crofoot (Nature Scientific Reports)

2015 Social Information Improves Location Prediction in the Wild
J. Li, I. Brugere, B. Ziebart, T. Y. Berger-Wolf, M. Crofoot, D. Farine (AAAI Workshop on Trajectory-based Behaviour Analytics)

2014 Modeling and Analysis of Spatiotemporal Social Networks
I. Brugere, V. M.V. Gunturi, and S. Shekhar (Encyclopedia of Social Network Analysis and Mining)

2012 Approximate Search on Massive Spatiotemporal Datasets
I. Brugere, K. Steinhaeuser, S. Boriah, and V. Kumar (IEEE ICDM Workshop on Spatial and Spatiotemporal Data Mining SSTDM)

2011 Incorporating Natural Variation into Time Series-Based Land Cover Change Identification
V. Mithal, A. Garg, I. Brugere, S. Boriah, V. Kumar, M. Steinbach, C. Potter, and S. Klooster (NASA Conference on Intelligent Data Understanding)

A Study of Time Series Noise Reduction Techniques in the Context of Land Cover Change Detection
X. Chen, V. Mithal, S.R. Vangala, I. Brugere, S. Boriah, and V. Kumar (NASA Conference on Intelligent Data Understanding)

A Novel Time Series Based Approach to Detect Gradual Vegetation Changes in Forests
Y. Chamber, A. Garg, V. Mithal, I. Brugere, M. Lau, V. Krishna, S. Boriah, M. Steinbach, V. Kumar, C. Potter, and S. Klooster (NASA Conference on Intelligent Data Understanding)

GOPHER: Global Observation of Planetary Health and Ecosystem Resources
A. Garg, V. Mithal, Y. Chamber, I. Brugere, V. Chaudhari, M. Dunham, V. Krishna, S. Krishnamurthy, S. Vangala, S. Boriah, M. Steinbach, V. Kumar, A. Cho, JD Stanley, T. Abraham, J. C. Castilla-Rubio, C. Potter, and S.A. Klooster (IEEE Geoscience and Remote Sensing Symposium IGARSS)

Areas of expertise

Graph mining and algorithms
Graph neural networks
Spatiotemporal statistics and mining
Nonparametric statistical methods
Bioinformatics
Interdisciplinary research

Service

Program Committees

2019 AAAI, CIKM, ICDM, KDD, SDM
2018 KDD

Reviewer

AAAI, CIKM, ICDM, IJCAI, KDD, PAKDD, SDM (Conference)
ACM CSUR, IMS AOAS, IEEE TKDE, KAIS (Journal)

Community

Bloomberg Data For Good Exchange PC
Google Lime campus ambassador
University of Washington-AccessSTEM volunteer
KDD Broadening Participation in Data Mining Coordinator, Mentoring Co-Chair (2014, 2016, 2017)

Scholarships and Awards

Scholarships

2014-2016 IGERT Electronic Security and Privacy Fellowship
2014-2016 UIC Chancellor's Graduate Research Fellowship
2014 Google Lime Scholarship

Awards

2017 IEEE ICDM Travel Award
SIAM SDM Travel Award
2016 Tapia Celebration of Diversity in Computing, Travel Award
SIGKDD Broadening Participation in Data Mining Travel Award
WSDM Travel Award
2015 ICDM Travel Award
Ubicomp Broadening Participation Travel Award
SIGKDD Ram Kumar Memorial Travel Award
Fifty for the Future Award supported by the Illinois Technology Foundation
SIAM CSE Travel Award supported by the Sustainable Horizons Institute
2014 ACM-BCB Travel Award
SIGKDD Broadening Participation in Data Mining Travel Award
Tapia Celebration of Diversity in Computing, Travel Award
SIGKDD Broadening Participation in Data Mining Travel Award

Notable Courses and Teaching

Teaching Assistant: CS401 – Computer Algorithms I
Advanced Computational Biology and Bioinformatics Seminar
Advanced Data Mining Seminar
Field Course in Computational Ecology at Mpala Research Centre, Kenya

Links

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ivanbrugere
LinkedIn
Google scholar
ORCiD