

Pittsburgh, PA

MARK HEIMANN

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CURRENT POSITION

Postdoctoral Researcher

Lawrence Livermore National Laboratory

Aug 2020-Present

Center for Applied Scientific
Computing

Remote (COVID-19)

- Working on graph data mining methodology and scientific applications.

EDUCATION

University of Michigan

Ann Arbor, MI

2015-2020

- Ph.D in Computer Science. Research: graph data mining, multi-network analysis, node embedding

Washington University in St. Louis

St. Louis, MO

2011-2015

- M.S. in Computer Science with a certificate in data mining and machine learning.
- A.B. in Economics and Mathematics *cum laude* with high distinction in economics.

PUBLICATIONS

- Jiong Zhu, Yujun Yan, Lingxiao Zhao, **Mark Heimann**, Leman Akoglu, and Danai Koutra. "[Beyond Homophily in Graph Neural Networks: Current Limitations and Effective Designs](#)." *NeurIPS 2020*.
- Mark Heimann**, Goran Murić, and Emilio Ferrara. "Structural Node Embedding in Signed Social Networks: Finding Online Misbehavior at Multiple Scales." *Complex Networks 2020*.
- Junchen Jin, **Mark Heimann**, Di Jin, and Danai Koutra. "[Understanding and Evaluating Structural Node Embeddings](#)." *KDD MLG Workshop 2020*. **Top submission invited for contributed talk**
- Kai Qin, Flora D. Salim, Yongli Ren, Wei Shao, **Mark Heimann** and Danai Koutra. "[G-CREWE: Graph CompREession With Embedding for Network Alignment](#)." *CIKM 2020*.
- Xiyuan Chen, **Mark Heimann**, Fatemeh Vahedian, and Danai Koutra. "[CONE-Align: Consistent Network Alignment with Proximity-Preserving Node Embedding](#)." *CIKM 2020*. **Also accepted at KDD MLG Workshop**
- Mark Heimann**, Tara Safavi, and Danai Koutra. "[Distribution of Node Embeddings as Multiresolution Features for Graphs](#)." *ICDM 2019*. **Best Student Paper**
- Di Jin, **Mark Heimann**, Ryan Rossi, and Danai Koutra. "[node2bits: Compact Time- and Attribute-aware Node Representations for User Stitching](#)." *PKDD 2019*.
- Di Jin*, **Mark Heimann***, Tara Safavi, Mengdi Wang, Wei Lee, Lindsay Snider, and Danai Koutra. "[Smart Roles: Inferring Professional Roles in Email Networks](#)." *KDD 2019*.
- Mark Heimann**, Haoming Shen, Tara Safavi, and Danai Koutra. "[REGAL: Representation Learning-based Graph Alignment](#)." *CIKM 2018*. **Taught in graduate classes at UMich, Purdue**
- Mark Heimann***, Wei Lee*, Shengjie Pan, Kuan-Yu Chen, and Danai Koutra. "[HashAlign: Hash-Based Alignment of Multiple Graphs](#)." *PAKDD 2018*.
- Yujun Yan, **Mark Heimann**, Di Jin, and Danai Koutra. "[Fast Flow-based Random Walk with Restart in a Multi-query Setting](#)." *SDM 2018*.
- Mark Heimann** and Danai Koutra. "[On Generalizing Neural Node Embedding Methods to Multi-Network Problems](#)." *KDD MLG Workshop, 2017*.

* equal contribution

TEACHING EXPERIENCE

- University of Michigan (2016-17): Foundations of Computer Science (EECS 376, ~500 students), Introduction to Artificial Intelligence (EECS 492/592, ~200 students), Advanced Data Mining (EECS 576, ~50 students)
- Washington University in St. Louis (2014-15): Introduction to Machine Learning (CSE 417A, ~100 students), Multi-Agent Systems (CSE 516A, ~30 students), Fair Division (CSE/Pol Sci 245A, ~50 students)

WORK EXPERIENCE

Visiting Research Assistant Artificial Intelligence Group	Information Sciences Institute	Jun 2019-Aug 2019 Marina Del Rey, CA
<ul style="list-style-type: none">Used node embeddings to identify cyberbullying in social media sessions. <i>Python</i>Theoretically analyzed algorithmically fair node embedding methods and proposed new techniques. <i>Python</i>		
Data Science Research Intern Big Data Experience Lab	Adobe Research	Jan 2019-Apr 2019 Remote
<ul style="list-style-type: none">Performed large-scale entity resolution on cross-device web log data with millions of users. <i>Python</i>		
Graduate Research Intern Computational Data Analytics Group	Oak Ridge National Laboratory	Apr 2018-Aug 2018 Oak Ridge, TN
<ul style="list-style-type: none">Developed dimensionality reduction algorithm with applications to unmixing of hyperspectral image data.Developed matrix factorization formulations for graph mining problems. <i>Python, Tensorflow, PyTorch</i>		
Software Engineer Intern Algorithm Development Team	Algorithmia	Jun 2015-Aug 2015 Seattle, WA
<ul style="list-style-type: none">Made cutting edge machine learning algorithms easy to use through a standardized API. <i>Python</i>Created applications to demonstrate their potential (Face Recognition demo in top 10 on Hacker News).		
Researcher NSF REU Program	Harvey Mudd College	Jun 2014-Aug 2014 Claremont, CA
<ul style="list-style-type: none">Designed and implemented an algorithm to generate more harmonically structured jazz solos. <i>Java</i>		
Researcher NSF REU Program	University of North Carolina, Greensboro	Jun 2013-Jul 2013 Greensboro, NC
<ul style="list-style-type: none">Resolved open mathematical questions with applications to computer science and biology. <i>Java</i>		
Student Trainee NHLBI Summer Institute for Training in Biostatistics (SIBS)	Washington University School of Medicine	Jun 2012-Jul 2012 St. Louis, MO
<ul style="list-style-type: none">Studied biostatistics and analyzed biomedical datasets as part of an accompanying practicum. <i>R</i>		

AWARDS

- Best Student Paper, ICDM 2019:** Best paper whose first author was a full-time student.
- Travel grants (KDD 2017,2019,2020; CIKM 2018; SDM 2019; ICDM 2019):** Attend and present work.
- Adam Smith Prize for Excellence in Economics (2015):** For writing an outstanding senior thesis.
- Arnold J. Lien Scholarship (2011):** Four-year full-tuition merit scholarship.

MENTORING

- Jing Zhu (UG, SU2020). Paper on node embedding in preparation. *Applying to MS/PhD programs.*
- Xingyu Lu (UG, SU2020). Paper on node embedding in preparation. *Applying to MS programs.*
- Xiyuan Chen (UG, FL2019-WN2020). Wrote senior thesis and published paper on network alignment. Contributed to second paper on network alignment in preparation. **Next:** MS at Stanford CS.
- Mark Jin (UG, WN2019-WN2020). Published paper on evaluating structural node embeddings. Journal version in preparation. **Next:** MS at Northwestern Data Science.
- Haoming Shen (MS, SU17-SU18). Published paper on network alignment. **Next:** PhD at UMich IOE.

REVIEWING

- Program Committee:** WebConf 2021, SDM 2021, Complex Networks 2020, CIKM Demos 2019-2020, PKDD GEM Workshop 2019-2020, ICANN 2019, ICDM Demos 2019
- Invited Reviewer:** Trans. on Computers, Trans. on Cybernetics, TKDE, KAIS, Neural Computation
- Subreviewer:** KDD, WWW, SDM, AAAI, PKDD, DAMI (Springer)

INVITED TALKS AND TUTORIALS

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- *Node Embedding on Multiple Networks*. 5th International Summer School on Data Science, Split, Croatia (virtual due to COVID-19). September 2020.
 - *REGAL: Representation Learning-based Graph Alignment*. NABD Conference, Criteo Labs, Ann Arbor, MI. May 2019.
 - *Machine Learning in Materials Science: An Introduction through Python*. Tutorial (co-instructor), Center for Nanophase Materials Science User Meeting, Oak Ridge National Laboratory. August 2018.

OTHER ACTIVITIES

- **Chess:** Active USCF Senior Master and FIDE Master (highest rating-based national and international titles). Multiple scholastic/collegiate national championship, state open championship titles. 10+ years teaching.
- **Other interests:** Powerlifting (USAPL competitor and state referee), music (experimental acoustic/electric)

REFERENCES

- Available upon request.