Petko Bogdanov

Department of Computer Science

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Education

PhD, Department of Computer Science *2012*

University of California, Santa Barbara, CA

Thesis: Beyond simple relations: Mining and search in temporal, composite and special-semantic graphs.

Advisor: Ambuj K. Singh

MS, Department of Computer Science *2012*

University of California, Santa Barbara, CA

BEng, Department of Computer Systems and Technology *2005*

Technical University – Sofia, Sofia, Bulgaria

Academic and Research Experience

Associate Professor *2020–to date*

University at Albany – SUNY, Albany, NY

Assistant Professor *2014–2020*

University at Albany – SUNY, Albany, NY

Postdoctoral Researcher *2012–2014*

University of California, Santa Barbara, CA

Mentor: Ambuj. K. Singh

Teaching and Research Assistant *2006–2012*

University of California, Santa Barbara, CA

Student Advising

- **PhD Graduated**

    3. Alexander Gorovits (2021), Thesis: "Mining Subgroups From Temporal Data: From the Parts to the Whole" (Now: Researcher at Regeneron Pharmaceuticals, Inc.)

    2. Lin Zhang (2020), Thesis: "Structured data mining: networks, time series, and time series of networks" (Now: Researcher at Tencent, China)
        * *Received University at Albany President's Distinguished Dissertation award*
        * *Nominated for SUNY Chancellor's Distinguished Dissertation award*

    1. Daniel J. DiTursi (2019), Thesis: "Wrinkles in Time: An Exploration of Non-Uniform Temporal Resolution in Network Data" (Now: Assistant Professor at Siena College)

- **PhD Current**

    Maxwell J. McNeil, Elham Sadeghi, Boya Ma

- **MS Graduated (12)**

    - **Theses:** Gaurav Ghosh (2016), Navita Jain (2016)
    - **Projects:** Sruthi Gudibandi (2016), Shervin Shahidizandi (2018), Akshit Bansal (2019), Michael Mai (2018), Rutvik Bhavsar (2019), Santosh K. Goli (2019), Abhishek Rai (2019), Divyarth Singh (2019), Abraham Zakharov (2020), Vijay Yeruva (2021)

- **BS Honors theses graduated and recognized research**

3. Matthew Killeen (BS 2022), *2021 Undergraduate Research Award from the Center for Undergraduate Research and Creative Engagement* at the University at Albany for: "Generation of Near-Infrared Genomic Silver Clusters via Attribute Regularized Variational Autoencoders". (Now: Software Engineer at Infosys)

2. James Oswald (BS 2021), *2020-2021 Presidential Award for Undergraduate Research* at the University at Albany for: "Design of near-infrared DNA-stabilized silver nanoclusters using variational autoencoders". (Now: PhD at RPI)

1. Timothy Larock (BS 2016), (co-advised): "Wireless Frequency Spectrum Characterization and Transmitter Detection Using Wavelets" (Now: PostDoc at Oxford, UK), 1st *Honors thesis from CS at UAlbany*

- **BS current (1)**

   - Brian McCorkle

- **High School Students Mentored (3)**

   K. Lunn (2007), R. Kim (2007), J. Mun (2016)

PUBLICATIONS

- **Refereed Journals**

   [J14] A. Magner, C. Kaminski†[1], and **Petko Bogdanov**. "Fast and Accurate Spreading Process Temporal Scale Estimation." Transactions on Machine Learning Research (TMLR), *2022*.

   [J13] P. Mastracco, A. Gonzlez-Rosell, J. Evans, **Petko Bogdanov**, and S. M. Copp. "Chemistry-Informed Machine Learning Enables Discovery of DNA-Stabilized Silver Nanoclusters with Near-Infrared Fluorescence." ACS nano, *2022*.

   [J12] W. Xiong†, L. Zhang†, M. McNeil†, **Petko Bogdanov**, and M. Zheleva. "SYMMeTRy: Exploiting MIMO Self-Similarity for Under-Determined Modulation Recognition." IEEE Transactions on Mobile Computing (TMC), *2021*.

   [J11] L. Zhang†, W. Zhang, M. McNeil†, N. Chengwang†, D. Matteson, and **Petko Bogdanov**. "AURORA: A Unified fRamework fOR Anomaly detection on multivariate time series." Data Mining and Knowledge Discovery (DAMI), Springer, *2021*.

   [J10] V. Amelkin, **Petko Bogdanov**, and A. K. Singh. "A Distance Measure for the Analysis of Polar Opinion Dynamics in Social Networks." ACM Transactions on Knowledge Discovery from Data, *2019*.

   [J9] S. M. Copp, A. Gorovits†, S. M. Swasey, S. Gudibandi†, **Petko Bogdanov**[2], and E. Gwinn. "Fluorescence color by data-driven design of genomic silver clusters." ACS nano 12, no. 8, pp. 8240-8247, *2018* (Impact Factor (2017): 13.709, **Top-18 Journal from all fields based on H5-index: 203**).
   Featured in: Advances in Engineering

   [J8] S. Swasey, S. M. Copp, H. C. Nicholson, A. Gorovits†, **Petko Bogdanov**[2], and E. Gwinn. "High throughput near infrared screening discovers DNA-templated silver clusters with peak fluorescence beyond 950 nm." Nanoscale, Royal Society of Chemistry, *2018* (Impact Factor: 7.233).

   [J7] S. Swasey, H. C. Nicholson, S. M. Copp, A. Gorovits†, **Petko Bogdanov**[2], and E. Gwinn. "Adaptation of a visible wavelength fluorescence microplate reader for discovery of near-infrared fluorescent probes." Review of Scientific Instruments 89, no. 9,*2018* (Impact Factor: 1.428).

   [J6] S. Medya, **Petko Bogdanov** and A. K. Singh, "Making a Small World Smaller: Path Optimization in Networks", IEEE Transactions on Knowledge and Data Engineering, *2018*. (Impact Factor: 3.438)

   [J5] **Petko Bogdanov**, N. Dereli, X.-H. Dang, D. S. Bassett, N. F. Wymbs, S. T. Grafton, A. K. Singh, "Learning about Learning: Mining Human Brain Sub-Network Biomarkers from fMRI Data", PLOS ONE, *2017*. (Impact Factor: 2.806)

   [J4] S. Copp, **Petko Bogdanov**[2], M. Debord, A. Singh, E. Gwinn, "Base Motif Recognition and Design of DNA Templates for Fluorescent Silver Clusters by Machine Learning", Journal of Advanced Materials, *2014*. (Impact Factor (2018): 25.809, **Top-7 journal from all fields based on H5-index: 252**)

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[1]Graduate and undergraduate students advised or co-advised by Petko Bogdanov are denoted by superscript (†).
[2]Led the data mining methodology effort for material property prediction and design.

[J3] **Petko Bogdanov**, M. Busch, J. Moehlis, A. Singh, B. Szymanski, "Modeling Individual Topic-Specific Behavior and Influence Backbone Networks in Social Media", Journal of Social Network Analysis and Mining, 2014.

[J2] J. Mohr, R. Wagner-Pacifici, R. Breiger, **Petko Bogdanov**, "Graphing the Grammar of Motives in National Security Strategies: Cultural Interpretation, Automated Text Analysis and the Drama of Global Politics," **Journal of Poetics**: Empirical Research on Culture, the Media, and the Arts, *2013*. (Impact Factor: 1.293)

[J1] **Petko Bogdanov**, A. Singh, "Molecular Function Prediction Using Neighborhood Features," IEEE/ACM Transactions on Computational Biology and Bioinformatics (**TCBB**), vol. 7, no. 2, pp. 208-217, Apr.-June *2010*. (Impact Factor: 1.609)

- **Refereed Conferences**[3,4]

[C38] L. Zhang[†], N. Moskwa, M. Larsen, **Petko Bogdanov** "Unsupervised Instance and Subnetwork Selection for Network Data", In In Proceedings of the 9th IEEE International Conference on Data Science and Advanced Analytics (**DSAA**), *2022*. (25% Accept. Rate)

[C37] F. Moomtaheen[†], M. Killeen[†], J. Oswald[†], A. Gonzlez-Rosell, P. Mastracco, A. Gorovits[†], S. Copp, **Petko Bogdanov** "DNA-Stabilized Silver Nanocluster Design via Regularized Variational Autoencoders", In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery & Data Mining. (**SIGKDD**), *2022*. (26% Accept. Rate Applied Track)

[C36] Q. Yuan, K. Doke, M. Gasco-Hernandez, J. R. Gil-Garca, M. Zheleva, **Petko Bogdanov** "Understanding Drivers and Challenges of Multi-actor Collaborations at the Local Level" In Proceedings of the Hawaii International Conference on System Sciences (**HICSS**), *2022*.

[C35] M. McNeil[†], B. Ma[†], **Petko Bogdanov** "SAGA: Signal-Aware Graph Aggregation", In Proceedings of SIAM International Conference on Data Mining. (**SDM**), *2022*. (27.8% Accept. Rate)

[C34] A. Gorovits[†], L. Zhang[†], E. Gujral, E. Papaplexakis, **Petko Bogdanov**, "Mining Bursty Groups from Interaction Data", In Proceedings of the 30th ACM International Conference on Information and Knowledge Management, (**CIKM**), *2021*. (21.7% Accept. Rate)

[C34] A. Gorovits[†], K. Doke, L. Zhang[†], M. Zheleva, **Petko Bogdanov**, "CORE: Connectivity Optimization via REinforcement Learning in WANETs", In Proceedings of the 18th Annual IEEE International Conference on Sensing, Communication, and Networking (**SECON**), *2021*. (26.4% Accept. Rate)

[C33] W. Xiong[†], **Petko Bogdanov**, M. Zheleva, "MODELESS: MODulation rEcognition with LimitEd SuperviSion.", In Proceedings of the 18th Annual IEEE International Conference on Sensing, Communication, and Networking (**SECON**), *2021*. (26.4% Accept. Rate)

[C32] K. Doke, H. Affinnih, Q. Yuan, M. Gasco-Hernandez, J.R. Gil-Garcia, **Petko Bogdanov**, Mariya Zheleva "Improving Emergency Preparedness and Response in Rural Areas.", In Proceedings of the ACM SIGCAS Conference on Computing and Sustainable Societies (**COMPASS**), pp. 66-78, *2021*. (36.7% Accept. Rate)

[C31] M. McNeil[†], L. Zhang[†], **Petko Bogdanov** "Temporal Graph Signal Decomposition", In Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining. (**SIGKDD**), *2021*. (15.4% Accept. Rate)

[C30] Q. Yuan, Y. Gulatee, M. Gasco-Hernandez, M. Zheleva, **Petko Bogdanov**, J. Gil-Garcia, "Understanding the Determinants of Adoption and Use of Information and Communication Technologies for Emergency Management: Proposing a Research Agenda based on Existing Academic Literature", In Proceedings of the IEEE 54th Hawaii International Conference on System Sciences (**HICSS**), *2021*.

[C29] W. Xiong[†], L. Zhang[†], M. McNeill[†], **Petko Bogdanov**, M. Zheleva "Fractals in the Air: Under-determined Modulation Recognition for MIMO Communication", In Proceedings of the IEEE International Conference on Computer Communications (**INFOCOM**), pp. 1201-1210, *2020*.

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[3]Computer science conferences are peer-reviewed and typically have higher impact than journals. For example, the top journal in data mining and engineering IEEE TKDE has an h5-index of 77 while the top data mining conference ACM SIGKDD has an h5-index of 86 (Source: Google Scholar Metrics 2019).

[4]All conference papers have been (or are about to be) presented as talks (not listed under talks).

Best Poster Award: <u>INFOCOM 2020</u>

[C28] W. Xiong[†], **Petko Bogdanov**, M. Zheleva, "Towards scalable zero-shot modulation recognition", In Proceedings of the IEEE 91st Vehicular Technology Conference (**VTC 2020-Fall**), *2020*.

[C27] L. Zhang[†], Alexander Gorovits[†], Wenyu Zhang, **Petko Bogdanov**, "Learning Periods from Incomplete Multivariate Time Series." In Proceeedings of the 2020 IEEE International Conference on Data Mining (**ICDM**), Sorento, Italy, *2020* (19.7% Accept. Rate).

[C26] L. Zhang[†], **Petko Bogdanov**, "Period Estimation For Incomplete Time Series", In Proceedings of the 7th IEEE International Conference on Data Science and Advanced Analytics (**DSAA**), *2020*.

[C25] W. Xiong[†], L. Zhang[†], M. McNeill[†], **Petko Bogdanov**, M. Zheleva, "Exploiting Self-Similarity for Under-Determined MIMO Modulation Recognition", In Proceedings of the IEEE International Conference on Computer Communications (**INFOCOM**), pp. 1201-1210, *2020* (19.8% Accept. Rate).

[C24] L. Zhang[†], A. Gorovits[†], **Petko Bogdanov**, "PERCeIDs: Periodic community detection.", In Proceedings of the 2019 IEEE International Conference on Data Mining (**ICDM**), Beijing, China, *2019* (18.5% Accept. Rate).

[C23] D. J. DiTursi[†], C. Kaminski[†], **Petko Bogdanov**, "Set Your Clock: Optimal timeline for network processes.", In Proceedings of the 2019 IEEE International Conference on Data Mining (**ICDM**), Beijing, China, *2019* (18.5% Accept. Rate).

[C22] M. Gasco-Hernandez, M. Zheleva, **Petko Bogdanov**, R. Gil-Garcia, "Towards a Socio-Technical Framework for Bridging the Digital Divide in Rural Emergency Preparedness and Response: Integrating User Adoption, Heterogeneous Wide-Area Networks, and Advanced Data Science", In Proceedings of 20th Annual International Conference on Digital Government Research (**DG.O**), Dubai, UAE, *2019*

[C21] L. Zhang[†], **Petko Bogdanov**, "DSL: Discriminative Subgraph Learning via Sparse Self-Representation", In Proceedings of the 2019 SIAM International Conference on Data Mining (**SDM**), Calgary, Canada, *2019* (22.7% Accept. Rate).

[C20] W. Xiong[†], **Petko Bogdanov**, M. Zheleva, "Robust and Efficient Modulation Recognition Based on Local Sequential IQ Features", In Proceedings of the IEEE International Conference on Computer Communications (**INFOCOM**), Paris, France, *2019* (19.7% Accept. Rate).

[C19] A. Joshi[†], Y. Zhang[†], **Petko Bogdanov**, and J.-H. Hwang. "An Efficient System for Subgraph Discovery." In Proceedings of the IEEE International Conference on Big Data (**BigData**), Seattle, WA. *2018* (18.9% Accept. Rate).

[C18] M. Zheleva, T. Larock[†], P. Schmitt, **Petko Bogdanov**, "Efficient Spectrum Summarization Using Compressed Spectrum Scans", In Proceedings of the IEEE International Symposium on New Frontiers in Dynamic Spectrum Access Networks (**DySPAN**), Seoul, Korea. *2018*.

[C17] A. Gorovits[†], E. Gujral, E. E. Papalexakis, **Petko Bogdanov**. "LARC: Learning Activity-Regularized Overlapping Communities Across Time." In Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (**SIGKDD**), pp. 1465-1474. ACM, *2018* (18.4% Accept. Rate).

[C16] M. Zheleva, **Petko Bogdanov**, T. Larock[†], P. Schmitt, "AirVIEW: Unsupervised transmitter detection for next generation spectrum sensing", In Proceedings of the IEEE International Conference on Computer Communications (**INFOCOM**), Honolulu, HI, USA, *2018*. (19.2% Accept. Rate)

[C15] D. DiTursi[†], G. Katsios[†], **Petko Bogdanov**, "Network Clocks: Detecting the Temporal Scale of Information Diffusion", In Proceedings of the IEEE International Conference on Data Mining (**ICDM**), New Orleans, USA. *2017*. (19.9% Accept. Rate)

[C14] D. DiTursi[†], G. Ghosh[†], **Petko Bogdanov** , "Local Community Detection in Dynamic Networks", In Proceedings of the IEEE International Conference on Data Mining (**ICDM**), New Orleans, USA. *2017*. (19.9% Accept. Rate)

[C13] V. Amelkin, **Petko Bogdanov** and A. K. Singh, "A Distance Measure for the Analysis of Polar Opinion Dynamics in Social Networks", In Proceedings of the IEEE International Conference on Data Engineering (**ICDE**), San Diego, USA. *2017*.

[C12] S. Medya, **Petko Bogdanov** and A. K. Singh, "Towards Scalable Network Delay Minimization", In Proceedings of the IEEE International Conference on Data Mining (**ICDM**), Barcelona, Spain. *2016.* (19.6% Accept. Rate)

[C11] X. H. Dang, H. You, **Petko Bogdanov** and A. K. Singh, "Learning Predictive Substructures with Regularization for Network Data", In Proceedings of the IEEE International Conference on Data Mining (**ICDM**), New Jersey, USA. *2015.* (8.4% Accept. Rate regular paper)

[C10] A. Silva, **Petko Bogdanov**, A. Singh, "Hierarchical In-Network Attribute Compression via Importance Sampling", In Proceedings of the 31st IEEE International Conference on Data Engineering (**ICDE**), Seoul, Korea, *2015.*

[C9] X. Dang, A. Singh, **Petko Bogdanov**, H. You, B. Hsu, "Discriminative Subnetworks with Regularized Spectral Learning for Global-state Network Data," In Proceedings of the 25th European Conference on Machine Learning / 18th European Conference on Principles and Practice of Knowledge Discovery in Databases (**ECML/PKDD**), Nancy, France *2014* (24% Accept. Rate) .

[C8] M. Mongiovi, **Petko Bogdanov**, A. Singh, "Mining Evolving Network Processes," In Proceedings of the IEEE International Conference on Data Mining (**ICDM**), Dallas, TX, USA *2013* (12% Accept. Rate Full Papers) .

[C7] **Petko Bogdanov**, A. Singh, "Accurate and Scalable Nearest Neighbors in Large Networks Based on Effective Importance," In Proceedings of the 22nd ACM International Conference on Information and Knowledge Management (**CIKM**), San Francisco, CA, USA *2013* (17% Accept. Rate Full Papers).

[C6] **Petko Bogdanov**, B. Baumer, P. Basu, A. Bar-Noy, A. Singh, "As Strong as the Weakest Link: Mining Diverse Cliques in Weighted Graphs," In Proceedings of the 24th European Conference on Machine Learning / 17th European Conference on Principles and Practice of Knowledge Discovery in Databases (**ECML/PKDD**), Prague, Czech Republic, *2013* (25% Accept. Rate).

[C5] **Petko Bogdanov**, M. Busch, J. Moehlis, A. Singh, B. Szymanski, "The Social Media Genome: Modeling Individual Topic-Specific Behavior in Social Media," In Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (**ASONAM**), Niagara Falls, Canada, *2013* (28% Accept. Rate).
    Featured in: <u>MIT Technology Review</u>, <u>KGO radio</u> and others.

[C4] K. Macropol, **Petko Bogdanov**, A. Singh, L. Petzold, X. Yan, "I Act, Therefore I Judge: Network Sentiment Dynamics Based on User Activity Change," In Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (**ASONAM**), Niagara Falls, Canada, *2013* (28% Accept. Rate).

[C3] M. Mongiovi, **Petko Bogdanov**, R. Ranca, A. Singh, E. Papalexakis, C. Faloutsos, "NetSpot: Mining Anomalous Regions on Dynamic Networks," In Proceedings of the SIAM International Conference on Data Mining (**SDM**), Austin, TX, USA *2013* (14% Accept. Rate).

[C2] **Petko Bogdanov**, M. Mongiovi, A. Singh, "Mining Heavy Subgraphs in Time-Evolving Networks," In Proceedings of the IEEE International Conference on Data Mining (**ICDM**), Vancouver, Canada *2011* (12% Accept. Rate Full Papers).

[C1] **Petko Bogdanov**, A. Singh, "Fast Nearest Neighbors in Large and Composite Networks," In Proceedings of the **Army Science Conference**, Orlando, FL, USA *2010.*

- **Refereed Workshops, Posters and Demos**

[W6] K. Doke, N. Chengwang[†], A. Boggio-Dandry, **Petko Bogdanov**, M. Zheleva "DEMO: EApp – Improving Rural Emergency Preparedness and Response", In Proceedings of The 25th Annual International Conference on Mobile Computing and Networking (**MobiCom**), Los Cabos, Mexico, *2019.*

[W5] M. Zheleva, T. Larock[†], P. Schmitt, **Petko Bogdanov** "AirPress: Efficient spectrum summarization using compressed spectrum scans", In Proceedings of IEEE INFOCOM 2018-IEEE Conference on Computer Communications Workshops (**INFOCOM WKSHPS**), Honolulu, HI, USA, *2018.*

[W4] M. Zheleva, **Petko Bogdanov**, D.-S. Zois, W. Xiong[†], R. Chandra, M. Kimball, "Smallholder Agriculture in the Information Age: Limits and Opportunities", Proceedings of the 2017 ACM Workshop on Computing Within Limits (**LIMITS**), Santa Barbara, USA. *2017.*

[W3] S. Copp, **Petko Bogdanov**, M. Debord, A. Singh, E. Gwinn, "Motif-based design of DNA templates for fluorescent silver clusters," In 11th Annual Conference on Foundations of Nanoscience: Self-assembled Architectures and Devices (**FNANO**), Snowbird, Utah, USA, *2014*.

[W2] **Petko Bogdanov**, N. Larusso, A. Singh, "Towards Community Discovery in Signed Collaborative Networks," In Workshop on Social Interactions Analysis and Service Providers (SIASP) at the IEEE International Conference on Data Mining (**ICDM**), Sydney, Australia, *2010*.

[W1] **Petko Bogdanov**, A. Singh, "Function Prediction Using Neighborhood Patterns," In Workshop on data Mining in Bioinformatics (BIOKDD) at the 14th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (**KDD**), Las Vegas, NV, USA *2008*.

- **Book Chapters, Encyclopedia Articles and Edited Volumes**

  [B5] K. Doke, Q. Yuan, M. Gasco-Hernandez, M. Sutherland-Mitzer, J. Gil-Garcia, **Petko Bogdanov**, M. Zheleva,"Supporting Resilience in Rural Emergency Preparedness and Response Through Improved Information Access.,", GetMobile: Mobile Computing and Communications, 24(2), 5-11, *2020*

  [B4] M. Larsen, **Petko Bogdanov**, R. Sood†, H. Kwon, D. Nelson, C. Duffy, S. Peters, S. Chittur, "Systems Biology: Salivary Gland Development, Disease, and Regenerative Medicine," Salivary Gland Development and Regeneration, pp 23–44, Springer, *2017*.

  [B3] J. Mohr, **Petko Bogdanov**, "Introduction–Topic Models: What They are and Why They Matter," Introduction for "Topic Models and the Cultural Sciences", Special issue in the **Journal of Poetics**: Empirical Research on Culture, the Media, and the Arts, editors. J. Mohr and Petko Bogdanov, *2013*. **Award:** Highly cited research by the editors of J. Poetics.

  [B2] J. Mohr, **Petko Bogdanov**, "Collection and Analysis of Relational Data from Digital Archives," In Encyclopedia of Social Network Analysis and Mining (**ESNAM**), *2013*.

  [B1] **Petko Bogdanov**, K. Macropol, A. Singh, "Function Annotation in Gene Networks," Book Chapter in "Functional Coherence of Molecular Networks in Bioinformatics" eds. M. Koyutrk, S. Subramaniam and A. Grama, **Springer** Verlag, *2012*.

Research Funding

- **Extramural**

  1. *Sponsor:* National Geospatial-Intelligence Agency (NGA), NURI Grant, **$361k**   *2020-2023*
     'Optimizing the Temporal Resolution in Dynamic Graph Mining",
     Role: PI.

  2. *Sponsor:* National Science Foundation (NSF), **$582k (UAlbany's support: $251k)**   *2020-2023*
     "Collaborative Research: New class of near-infrared fluorophores derived from DNA-templated silver clusters for deep tissue imaging."
     Role: PI, Leads the data mining and optimization methodology. Collaborative project with UC Irvine, PI: S. Copp

  3. *Sponsor:* National Science Foundation (NSF), **$1.5 Million**   *2018-2023*
     "SCC: Integrating heterogeneous wide-area networks and advanced data science to bridge the digital divide in rural emergency preparedness and response",
     Role: Co-PI, 33% financial and credit responsibility, Leads the data mining and optimization methodology and co-leads the development of information exchange infrastructure. PI: M. Zheleva

  4. *Sponsor:* US Office of Naval Research (ONR), **$79,979**   *2018-2019*
     "STTR (Phase 1): Multi-Layer Mapping of Cyberspace using Composite Dynamic Graph Extraction, Mining and Visualization",
     Role: PI, Led the design and application of graph mining methodology, with Charles River Analytics.

  5. *Sponsor:* DARPA, **$2.6 Million**, UAlbany's portion: **$800,000**   *2017-2019*
     "SimON: Accurate and Scalable Simulation of Influence in Online Social Networks",
     Role: Co-PI, 40% financial and credit responsibility UAlbany, Led the data mining methodology. PI (UAlbany): T. Strzalkowski

  6. *Sponsor:* National Science Foundation (NSF), **$70,774**   *2016-2017*

"Cracking the Color Code of DNA-stabilized Metal Nanoclusters with Rapid Optical Array Characterization and Machine Learning",
Role: PI, subaward, Led the design and application of data mining methodology, with E. Gwinn, UC Santa Barbara.

7. *Sponsor:* Army Research Lab (ARL), **$101,280** (while PostDoc at UC Santa Barbara)   *2013-2014*
"Multi-genre Network Modeling and Design using Composite Graphs,",
Role: co-PI, Co-led the design of data mining methodology, PI: A. Singh, with CUNY and BBN.

8. *Sponsor:* Erasmus, European Union, **2 week faculty & 6 months student exchange**   *2018-2020*
"Erasmus+ Programme: for exchange of students and faculty",
Role: PI. with M. Zheleva, UAlbany and V. Pejovic at University of Ljubljana, Slovenia.

9. *Sponsor:* DOE Center for Integrated Nanotechnologies (CINT), **Access to equipment.**   *2018-2019*
"Nano-Materials Informatics Methods for Soft-Synthesis Nanomaterial Design and Discovery",
Role: PI Co-lead the generation of synthesis data for "giant" quantum dots to design and train predictive synthesis ML. with J. Hollingsworth, CINT, Los Alamos National Laboratory.

- **University at Albany—SUNY**

  1. Aligning UAlbany Strengths with National Funding Priorities, **$50,000**   *2022-2023*
  "Network for Integrated Sensors, Screening, and Security (NIS^3)", *Role: co-PI*, PI: J. Petruccelli (Physics)

  2. Next Research Frontier (NeRF) initiative for interdisciplinary collaborations, **$20,000**   *2019-2020*
  "Identifying Mesenchymal Competency Signatures for Secretory Acinar Cell Differentiation Using RNA Transcriptome Analyses Coupled with Computational Segregation of Cell Phenotype States",
  Role: co-PI, PI: M. Larsen (Biology)

  3. Faculty research award program (FRAP-A), **$9,936**   *2017-2019*
  "Learning the Clock of Network Processes from Big Data",
  Role: PI

  4. Presidential Innovation Fund for Research and Scholarship, **$41,260**   *2017-2018*
  "A systems-oriented framework for mining complex subgraphs",
  Role: co-PI, PI: J. Hwang

  5. Faculty research award program (FRAP-A), **$9,080**   *2015-2017*
  "Detecting and Modeling Bursty Network Processes",
  Role: PI

INVITED, CONTRIBUTED TALKS AND TUTORIALS

- *Lightning talk:* "AI for structured data", UAlbany Artificial Intelligence Symposium, November, 2022
- *Contributed talk:* "Optimal resolution for dynamic graph mining", 7th Annual Intelligence Community Academic Research Symposium (ICARS), September, 2021
- *Invited talk:* "Temporal graph mining and its applications", Clarkson University, NY, February, 2020
- *Contributed talk:* "Are There Genes for Fluorescent DNA-Stabilized Silver Clusters", Materials Research Society—Fall Meeting, November, 2018
- *Invited talk:* "Treating time as a first-class citizen in temporal graph mining", Arizona State University, November, 2018
- *Invited talk:* "Treating time as a first-class citizen in temporal graph mining", Rensselaer Polytechnic Institute, November, 2018
- *Invited talk:* "Towards data-driven materials design: a case study for fluorescent silver nano-clusters", Los Alamos National Laboratory, September, 2017
- *Invited talks:* "Mining dynamic networks", Technical, University-Sofia, Bulgaria; Sofia University, Bulgaria; and Technical University-Plovdiv, Bulgaria, December, 2016
- *Tutorial:* "Anomalous and Significant Subgraph Detection in Attributed Networks" with F. Chen, D. B. Neill, and A. K. Singh, IEEE Intl. Conference on Big Data, December, 2016
- *Contributed talk:* "Using Machine Learning to Decode the "Genome" of DNA-Stabilized Silver Clusters", Materials Research Society—Fall Meeting, December, 2015

- *Invited talk:* "Mining network processes", Rensselaer Polytechnic Institute, April, 2015
- *Contributed talk:* "Detecting significant network processes", Workshop in Scientific Collaboration (WISC): "Following signals", University at Albany - SUNY, February, 2015

PROFESSIONAL SERVICE ACTIVITY

- *Associate Editor* of IEEE Transactions on Knowledge and Data Engineering (TKDE), 2019–to date
- *Tutorial Co-Chair* for the 29th SIGKDD Conference on Knowledge Discovery and Data Mining, 2023
- *Tutorial Co-organizer* "Anomalous and Significant Subgraph Detection in Attributed Networks" with F. Chen, D. B. Neill, and A. K. Singh, IEEE Intl. Conference on Big Data, December, 2016
- *Co-editor* of a special issue for the Journal of Poetics on "Topic Modeling and Text Analysis: New Collaborative Possibilities Linking Computer Scientists with Researchers in Humanities and the Social Sciences", *2013.*
- *Co-chair* of the first Workshop on Dynamic Network Mining and Management (DyNetMM) at the ACM SIGMOD International Conference on Management of Data, New York, NY, USA, *2013.*
- *Funding Panel Reviewer*
    - NSF, 2014, 2017, 2018, 2019, 2021
    - *Ad-hoc Reviewer* NSF CISE, 2016, 2017
    - UAlbany FRAP (seed grants) Panel, 2017
    - *Ad-hoc Reviewer* Netherlands Organisation for Scientific Research (NWO), 2018
- *Senior Program Committee Member:*
    1. SDM '21, '22, '23
    2. CIKM '22
    3. AAAI '22, '23
- *Program Committee Member:*
    1. ACM SIGKDD'15,'16,'18,'19,'20,'21,'22
    2. IEEE ICDM'14,'15,'16,'17,'18,'19,'20,'22
    3. ACM CIKM '14,'15,'16,'19
    4. IEEE/ACM ASONAM'13,'14,'15,'19
    5. IEEE DSAA'14,'15,'16,'17,'18,'19,'20
    6. WWW'16,'17,'18
    7. ECML/PKDD'15
    8. WSDM'19,'20
    9. IJCAI'21
    10. BDA EdCon Europe'15
    11. Workshops: KDD W. ODD'15,'16,'19; WSDM W. on Diffusion Networks and Cascade Analytics'14; VLDB W. on Ranking in Databases (DBRank)'13
- *Committee Member for Best Poster* IEEE ICDE, Seoul, Korea, 2015
- *Reviewer* for SIGMOD, SIGKDD, ICDM, VLDB, ASONAM, TCBB, TKDD, TCSS, TBD, TBME, TKDE, PVLDB, TOIT, TIST, J. of Sociological Methodology, J. Data and Knowledge Engineering (DKE), J. of Computer Communications

UNIVERSITY, COLLEGE AND DEPARTMENTAL SERVICE ACTIVITY

- *Academic search committees (Faculty and Staff Hiring)*
    1. Computer Science Tenure Track Faculty Search, University at Albany—SUNY,'15-'16
    2. Dean of the Honors College Search, University at Albany—SUNY,'15-'16
    3. Administrative Recruitment Committee Search, University at Albany—SUNY,'14
- SUNY FACT^2 awards committee, '20, '21

- Graduate Student Admissions Committee, University at Albany—SUNY,'14,'15,'16,'17,'18,'19,'20,'21
- PhD Progress Committee, University at Albany—SUNY,'17,'18,'19
  Role: Spearheaded the development of a departmental system for PhD student progress evaluation, deployed in 2019.
- TA Evaluation Committee, University at Albany—SUNY,'18
- Student Grievance Committee, University at Albany—SUNY,'19

Awards

- Best Poster Award for "Fractals in the Air: Under-determined Modulation Recognition for MIMO Communication", In Proceedings of the IEEE International Conference on Computer Communications (**INFOCOM**), pp. 1201-1210, *2020.*
- Certificate for highly cited research for "Topic models: what they are and why they matter" with J. Mohr, by the Editors of J. Poetics, Elsevier, Dec. *2016.*
- Nominated for Torch Night award for impact on undegraduate students' academic and personal success, UAlbany, *2016.*
- Lisa Kaz Graduate Fellowship Award, Department of Computer Science, UCSB, *2006.*
- NSF Travel Award to attend the IEEE International Conference on Data Mining (ICDM), *2010,2011.*
- President's Work-Study Award, UCSB, *2008, 2009, 2010.*

Teaching

- Classes taught at University at Albany – SUNY.

– CSI 531: Data Mining (graduate)	*Fall 2022*
– CSI 403: Algorithms and data structures	*Fall 2022*
– CSI 531: Data Mining (graduate)	*Spring 2022*
– CSI 531: Data Mining (graduate)	*Fall 2021*
– CSI 403: Algorithms and data structures	*Fall 2021*
– CSI 531: Data Mining (graduate)	*Spring 2021*
– CSI 499: Capstone Project (undergraduate)	*Fall 2020*
– CSI 431: Data Mining (undergraduate)	*Fall 2020*
– CSI 403: Algorithms and data structures (undergraduate)	*Spring 2020*
– CSI 431/531: Data Mining (undergraduate / graduate)	*Fall 2019*
– CSI 403: Algorithms and data structures (undergraduate)	*Spring 2019*
– CSI 431: Data Mining (undergraduate)	*Fall 2018*
– CSI 431/531: Data Mining (undergraduate / graduate)	*Fall 2017*
– CSI 508: Database Systems I (graduate) [Substitute: end of semester.]	*Fall 2017*
– CSI 660: Advanced Topics in Data Mining: Mining Massive Datasets (graduate)	*Spring 2017*
– CSI 403: Algorithms and data structures (undergraduate)	*Fall 2016*
– CSI 660: Advanced Topics in Data Mining: Mining Massive Datasets (graduate)	*Spring 2016*
– CSI 660: Advanced Topics in Data Mining: Mining Massive Datasets (graduate)	*Fall 2015*
– CSI 131: Introduction to Data Analytics (undergraduate, team-based learning)	*Spring 2015*
– CSI 660: Advanced Topics in Data Mining: Network Mining, (graduate)	*Fall 2014*

- Instructor for the Summer Academy for underprivileged youth — *Summer 2010*
  Step for Bulgaria (www.stepforbulgaria.org), Bulgaria.

Industry Experience

Software Engineering Intern at Google. — *June 2009 – September 2009*

Data analysis/mining as part of the AdSense team.

Senior Software Engineer at Sciant Ltd. (currently VMware)   _February 2004 – August 2006_

Lead a team of software engineers and software engineers in test.
Completed a course in Project Management.
Designed ISO 9001:2000 Quality Management System procedures.

SKILLS AND INTERESTS

Programming and Editing: Java, C++, C#, Bash, Python, Awk, Matlab, SQL, R, LaTeX.

Languages: English (fluent); Bulgarian (native speaker); German (beginner); Spanish (beginner).