

## ARITRA KONAR

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### CONTACT INFORMATION

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### RESEARCH INTERESTS

Network Science, Non-linear Optimization, Machine Learning, Graph Theory, Wireless Communications.

### EDUCATION

**University of Virginia**, VA, USA

Postdoctoral Research Associate, Electrical Engineering (Oct. 2017 - present)

- Advisor: Professor Nicholas D. Sidiropoulos

**University of Minnesota, Twin Cities**, MN, USA

Ph.D., Electrical Engineering (Sep. 2012 - Sep. 2017)

- Advisor: Professor Nicholas D. Sidiropoulos
- Thesis: **Non-convex Quadratically Constrained Quadratic Programming: Hidden convexity, scalable approximation, and applications**

**University of Minnesota, Twin Cities**, MN, USA

Master of Science, Electrical Engineering (Sep. 2012 - Oct. 2014)

- Advisor: Professor Nicholas D. Sidiropoulos
- Thesis: **Parametric Frugal Sensing of Power Spectra for Moving Average Models.**

**West Bengal University of Technology**, Kolkata, India

Bachelor of Technology, Electronics and Communications Engineering (Aug. 2007 - May 2011)

### FUNDING

**III: Small: A Submodular Framework for Scalable Graph Matching with Performance Guarantees**, NSF IIS-1908070, PI: N. D. Sidiropoulos, co-PI: **A. Konar**, Period: Oct. 2019 – Sept. 2022. Funding level: \$456,742.

### HONORS AND AWARDS

*UVA Engineering Postdoctoral Teaching Fellowship* **Sep. 2018 - Dec. 2018**  
Awarded on a competitive basis by School of Engineering and Applied Sciences (SEAS) at the University of Virginia. The program provides research associates with the opportunity to prepare themselves further for academic careers by teaching a SEAS undergraduate or graduate course.

*Finalist for Best Student Paper Award at SPAWC 2018* **July 2018**  
The paper “Mirror-Prox SCA Algorithm for Multicast Beamforming and Antenna Selection” co-authored with Mohamed Salah was chosen as one of six best student paper finalists at IEEE SPAWC 2018.

*UMN Doctoral Dissertation Fellowship* **Sep. 2016 - May 2017**  
Awarded on a competitive basis by the University of Minnesota, Twin Cities. The DDF program gives the University’s most accomplished Ph.D. candidates an opportunity to devote full-time effort to dissertation research and writing during the fellowship year.

TEACHING  
EXPERIENCE

**Convex Optimization**, University of Virginia, Fall 2018 (Instructor): designed and taught a course covering the basics of convex optimization theory and algorithms, with an emphasis on large-scale optimization in machine learning (the first time such a course was offered in the Dept. of ECE).

PUBLICATIONS

**Computer Science Conferences**

**C4.** **A. Konar**, and N. D. Sidiropoulos, ‘Exploring the subgraph density-size trade-off via the Lovasz extension,” *Proc. ACM WSDM*, March 8-12, 2021, Jerusalem, Israel. (**Acceptance Rate:** 18.6%)

**C3.** **A. Konar**, and N. D. Sidiropoulos, “Soft Graph Matching: Submodular Relaxation and Lovasz Extension,” *Proc. IEEE ICDM*, November 17-20, 2020, Sorrento, Italy. (**Acceptance Rate:** 9.8%)

**C2.** **A. Konar**, and N. D. Sidiropoulos, “Mining large quasi-cliques with quality guarantees from vertex neighborhoods,” *Proc. ACM KDD* (Research Track), August 23-27, 2020, San Diego. (**Acceptance Rate:** 16.9%)

**C1.** **A. Konar**, and N. D. Sidiropoulos, “Iterative graph alignment via supermodular approximation,” *Proc. IEEE International Conference on Data Mining*, Nov. 8-11, 2019, Beijing, China. (**Acceptance Rate:** 18.5%)

**Journal Articles**

**J11.** M. S. Ibrahim, A. S. Zamzam, **A. Konar**, and N. D. Sidiropoulos, “Cell-edge detection via selective cooperation and generalized canonical correlation”, *under revision*, *IEEE Transactions on Wireless Communications*, submitted, March 2020.

**J10.** **A. Konar**, and N. D. Sidiropoulos, “Graph matching via the lens of supermodularity,” *accepted*, *IEEE Transactions on Knowledge and Data Engineering*, July 2020, DOI: 10.1109/TKDE.2020.3008128.

**J9.** M. S. Ibrahim, **A. Konar**, N. D. Sidiropoulos, “Fast algorithms for joint multicast beamforming and antenna selection,” *IEEE Transactions on Signal Processing*, vol. 66, no. 18, pp. 1897–1909, March 2020.

**J8.** **A. Konar**, and N. D. Sidiropoulos, “A simple and effective approach for transmit antenna selection in multi-user massive MIMO leveraging submodularity,” *IEEE Transactions on Signal Processing*, vol. 66, no. 18, pp. 4869–4883, Sept. 2018.

**J7.** Y. Shi, **A. Konar**, N. D. Sidiropoulos, X.-P. Mao, and Y.-T. Liu, “Learning to beamform for minimum outage,” *IEEE Transactions on Signal Processing*, vol. 66, no. 19, pp. 5180–5193, Sept. 2018.

**J6.** **A. Konar**, and N. D. Sidiropoulos, “First-order methods for fast Feasibility Pursuit of non-convex QCQPs,” *IEEE Transactions on Signal Processing*, vol. 65, no. 22, pp. 5927–5941, Nov. 2017.

**J5.** **A. Konar**, and N. D. Sidiropoulos, “Fast approximation algorithms for a class of non-convex QCQP problems using first-order Methods,” *IEEE Transactions on Signal Processing*, vol. 65, no. 13, pp. 3494–3509, July 2017.

**J4. A. Konar**, and N. D. Sidiropoulos, “Parametric frugal sensing for Autoregressive and Autoregressive Moving Average power spectra,” *IEEE Transactions on Signal Processing*, vol. 64, no. 20, pp. 5353–5366, Oct. 2016.

**J3. A. Konar**, and N. D. Sidiropoulos, “Hidden convexity in QCQP with Toeplitz-Hermitian quadratics,” *IEEE Signal Processing Letters*, vol. 22, no. 10, pp. 1623–1627, Oct. 2015.

**J2.** O. Mehanna, K. Huang, B. Gopalakrishnan, **A. Konar**, and N.D. Sidiropoulos, “Feasible Point Pursuit and successive approximation of non-convex QCQPs,” *IEEE Signal Processing Letters*, vol. 22, pp. 804–808, July 2015.

**J1. A. Konar**, N. D. Sidiropoulos, and O. Mehanna, “Parametric frugal sensing of power spectra for Moving Average Models,” *IEEE Transactions on Signal Processing*, vol. 63, no. 5, pp. 1073–1085, March 2015.

### Refereed Conference Articles in Signal Processing

**C14. A. Konar**, and N.D. Sidiropoulos, “Fast optimization of Boolean quadratic functions via iterative submodular approximation and max-flow,” *Proc. IEEE ICASSP*, May 12-17, 2019, Brighton, United Kingdom.

**C13.** M. Salah, **A. Konar**, M. Hong, and N. D. Sidiropoulos, “Mirror-Prox SCA algorithm for multicast beamforming and antenna selection,” *Proc. IEEE SPAWC 2018*, June 25-28, Kalamata, Greece (**Finalist for best student paper award**).

**C12.** K. Slavakis, **A. Konar**, and N. D. Sidiropoulos, “Fast projection-based solvers for the non-convex quadratically constrained quadratic feasibility problem,” *Proc. IEEE ICASSP 2018*, April 15-20, 2018, Calgary, Canada.

**C11.** F. Almutairi, **A. Konar**, and N. D. Sidiropoulos, “Scalable energy disaggregation via successive submodular approximation,” *Proc. IEEE ICASSP 2018*, April 15-20, 2018, Calgary, Canada.

**C10.** Y. Shi, **A. Konar**, N. D. Sidiropoulos, X.-P.Mao, and Y.-T Liu, “Transmit beamforming for minimum outage via stochastic approximation,” *invited paper at IEEE CAMSAP 2017*, December 10-13, 2017, Curacao, Dutch Antilles.

**C9. A. Konar**, A. S. Zamzam, and N. D. Sidiropoulos, “Decentralized power system state estimation via non-convex multi-agent optimization,” *invited paper at IEEE GLOBALSIP 2017*, November 14-16, 2017, Montreal, Canada.

**C8. A. Konar**, and N. D. Sidiropoulos, “Greed is good: Leveraging submodularity for antenna selection in Massive MIMO,” *Asilomar Conference on Signals, Systems and Computers*, October 29 - November 1, 2017, Pacific Grove, CA.

**C7. A. Konar**, and N. D. Sidiropoulos, “Fast Feasibility Pursuit for non-convex QCQPs via first-order methods,” *Proc. IEEE ICASSP 2017*, March 5-9, 2016, New Orleans, USA.

**C6.** M. A. Vazquez, **A. Konar**, L. Blanco, N. D. Sidiropoulos, and A. I. Perez-Neira, “Non-convex consensus ADMM for satellite precoder design,” *Proc. IEEE ICASSP 2017*, March 5-9, 2016, New Orleans, USA.

**C5. A. Konar**, and N. D. Sidiropoulos, “A fast approximation algorithm for single-group multicast beamforming with large antenna arrays,” *invited paper at IEEE SPAWC 2016*, July 3-6, 2016, Edinburgh, UK.

**C4. A. Konar**, and N. D. Sidiropoulos, “Parametric frugal sensing of autoregressive power spectra,” *Proc. IEEE ICASSP 2016*, March 20-25, 2016, Shanghai, China.

**C3. A. Konar**, and N. D. Sidiropoulos, “Distributed compression and maximum-likelihood reconstruction of finite autocorrelation sequences,” *Asilomar Conference on Signals, Systems and Computers*, November 8-11, 2015, Pacific Grove, CA.

**C2. A. Konar**, R. Sun, N. D. Sidiropoulos, and Z.-Q. Luo, “Interference alignment via Feasible Point Pursuit,” *Proc. IEEE SPAWC 2015*, June 28-July 1, 2015, Stockholm, Sweden.

**C1. A. Konar**, and N. D. Sidiropoulos, “Parametric frugal sensing of moving average power spectra,” *Proc. IEEE ICASSP 2015*, April 19-24, 2015, Brisbane, Australia.

INVITED TALKS      “Graph Matching through the Lens of Supermodularity”, Network Science Seminar, Biocomplexity Institute @ UVA, Sept. 3, 2019.

“Submodular and Stochastic Optimization for Transmit Antenna Selection and Beamforming in 5G”, Wireless @ VT Seminar, Dept. of ECE, Virginia Tech, Nov. 29, 2018.

REVIEWING  
ACTIVITIES      IEEE Transactions on Signal Processing, IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Signal Processing Letters, IEEE Communications Letters, ICASSP 2016, ICC 2018, NeurIPS 2020.