Ying Sun

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Education

- 09/2011-07/2016: Ph.D. (advisor: Prof. Daniel P. Palomar)
  Department of Electronic and Computer Engineering, **The Hong Kong University of Science and Technology**
  Thesis: Majorization-Minimization Algorithms and Its Applications in Robust Covariance Matrix Estimation

- 01/2016-03/2016: Visiting Ph.D. student (advisor: Prof. Gesualdo Scutari)
  School of Industrial Engineering, **Purdue University**

- 09/2007-06/2011: B.Eng.
  Electronic and Information Engineering, **Huazhong University of Science and Technology**, Wuhan, China.

Working Experience

- 08/2016-present: Postdoctoral researcher (advisor: Prof. Gesualdo Scutari)
  School of Industrial Engineering, **Purdue University**

Research Interest

- **Data science and analytics:**

  Optimization for machine learning, distributed and parallel optimization, stochastic optimization, computational statistics, majorization-minimization algorithms
- **Statistical learning over networks:**

  Decentralized estimation and inference, federated learning
- **Statistical signal processing:**

  High dimensional covariance matrix estimation, sparse component analysis

Awards and Honors

- Best student paper award at *2017 IEEE workshop on Computational Advances in Multi-Sensor Adaptive Processing* [C9].

- Web of science highly cited paper, 2018 [J6].

Publications

Book Chapter

- G. Scutari and <u>Y. Sun</u>,"Parallel and distributed successive convex approximation methods for big-data optimization," In *Multi-agent Optimization*, Eds. F. Facchinei and J.-S. Pang, Lecture Notes in Mathematics, Springer, 2018, pp. 141-308. The order of the authors is alphabetical.

Preprints

[J12] I. Notarnicola*, <u>Y. Sun</u>*, G. Scutari, G. Notarstefano, "Distributed big-data optimization via block-iterative gradient tracking," *IEEE Transactions on Automatic Control* (under revision), 2019. [Online]. Available: arXiv:1808.07252. (*equal contribution)

[J11] Y. Tian, <u>Y. Sun</u>, and G. Scutari, "Achieving linear convergence in distributed asynchronous multi-agent optimization," submitted to *IEEE Transactions on Automatic Control* (under revision), 2018. [Online]. Available: arXiv:1803.10359.

[J10] <u>Y. Sun</u>, A. Daneshmand, and G. Scutari, "Convergence rate of distributed optimization algorithms based on gradient tracking," submitted, 2019. [Online]. Available: arXiv:1905.02637.

Journal Papers

[J9] A. Daneshmand, <u>Y. Sun</u>, G. Scutari, F. Facchinei, and Brian M. Sadler, "Decentralized dictionary learning over time-varying digraphs," *Journal of Machine Learning Research* (accepted), 2018. [Online]. Available: arXiv:1808.05933.

[J8] G. Scutari and <u>Y. Sun</u>, " Distributed nonconvex constrained optimization over time-varying digraphs," *Mathematical Programming, Series B*, vol. 176, no. 1, pp. 497-544, Jul. 2019. [Online]. Available: arXiv:1809.01106. The order of the authors is alphabetical.

[J7] S. Shen, <u>Y. Sun</u>, S. Song, D. P. Palomar, and R. D. Murch, "Successive Boolean optimization of planar pixel antennas," *IEEE Transactions on Antennas and Propagation*, vol. 65, no. 2, pp. 920-925, Feb. 2017.

[J6] <u>Y. Sun</u>, P. Babu, and D. P. Palomar, "Majorization-minimization algorithms in signal processing, communications, and machine learning," overview article, *IEEE Transactions on Signal Processing*, vol. 65, no. 3, pp. 794-816, Feb. 2017. **Web of Science highly cited paper, 2018**

[J5] K. Benidis, <u>Y. Sun</u>, P. Babu, D. P. Palomar, "Orthogonal sparse PCA and covariance estimation via Procrustes reformulation," *IEEE Transactions on Signal Processing*, vol. 64, no. 23, pp. 6211-6226, Dec. 2016.

[J4] <u>Y. Sun</u>, A. Breloy, P. Babu, D. P. Palomar, F. Pascal, and G. Ginolhac, "Low-complexity algorithms for low rank clutter parameters estimation in radar systems," *IEEE Transactions on Signal Processing*, vol. 64, no. 8, pp. 1986-1998, Apr. 2016.

[J3] <u>Y. Sun</u>, P. Babu, and D. P. Palomar, "Robust estimation of structured covariance matrix for heavy-tailed elliptical distributions," *IEEE Transactions on Signal Processing,* vol. 64, no. 14, pp. 3576-3590, Jul. 2016.

[J2] <u>Y. Sun</u>, P. Babu, and D. P. Palomar, "Regularized robust estimation of mean and covariance matrix under heavy-tailed distributions," *IEEE Transactions on Signal Processing*, vol. 63, no. 12, pp. 3096-3109, Jun. 2015.

[J1] <u>Y. Sun</u>, P. Babu, and D. P. Palomar, "Regularized Tyler's scatter estimator: existence, uniqueness, and algorithms," *IEEE Transactions on Signal Processing*, vol. 62, no. 19, pp. 5143-5156, Oct. 2014.

Conference Papers

[C11] Y. Tian, Y. Sun, B. Du, and G. Scutari, "ASY-SONATA: Achieving geometric convergence for distributed asynchronous optimization," Allerton Conference on Communication, Control, and Computing (Allerton), Monticello, IL, Oct. 2-5, 2018.

[C10] I. Notarnicola*, Y. Sun*, G. Scutari, G. Notarstefano, "Distributed big-data optimization via block-iterative convexification and averaging," in *Proc. of the 56th IEEE Conference on Decision and Control (CDC)*, Melbourne, Australia, Dec. 12-15, 2017, pp. 2281-2288. (*equal contribution)

[C9] I. Notarnicola*, Y. Sun*, G. Scutari, and G. Notarstefano, "Distributed Big-Data Optimization via Block Communications," in *Proc. of the 2017 IEEE workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Curaçao, Dutch Antilles, Dec. 10-13, 2017, pp. 1-5. (*equal contribution)

Best Student Paper Award

[C8] Y. Sun and G. Scutari, "Distributed nonconvex optimization for sparse representation," in *Proc. of the 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),* New Orleans, Mar. 2017, pp. 4044-4048, [Online]. Available: arXiv:1611.06576.

[C7] A. Daneshmand, Y. Sun, G. Scutari, and F. Facchinei, "D^{2}L: Decentralized dictionary learning over dynamic networks," in *Proc. of the 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),* New Orleans, Mar. 2017, pp. 4084-4088.

[C6] Y. Sun, G. Scutari, and D. P. Palomar, "Distributed nonconvex multiagent optimization over time-varying networks," in *Proc. of the 50th Asilomar Conference on Signals, Systems, and Computers,* Asilomar, Nov. 2016, pp. 788-794. [Online]. Available: arXiv:1607.00249.

[C5] A. Breloy, Y. Sun, P. Babu, and D. P. Palomar, "Block majorization-minimization algorithms for low-rank clutter subspace estimation," in *Proc. 24th European Signal Processing Conference (EUSIPCO)*, Budapest, Aug. 2016, pp. 2186-2190.

[C4] A. Breloy, Y. Sun, P. Babu, G. Ginolhac, D. P. Palomar, and F. Pascal, "A robust signal subspace estimator," in *Proc. IEEE Statistical Signal Processing Workshop (SSP),* Palma de Mallorca, Jun. 2016, pp. 1-4.

[C3] K. Benidis, Y. Sun, P. Babu, and D. P. Palomar, "Orthogonal sparse eigenvectors: A procrustes problem," in *Proc. of the 2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),* Shanghai, Mar. 2016, pp. 4683-4686.

[C2] Y. Sun, P. Babu, and D. P. Palomar, "Robust estimation of structured covariance matrix for heavy-tailed distributions," in *Proc. of the 2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Brisbane, Apr. 2015, pp. 5693-5697.

[C1] Y. Sun, P. Babu, and D. P. Palomar, "Regularized robust estimation of mean and covariance matrix under heavy tails and outliers," in *Proc. of the IEEE 8th Sensor Array and Multichannel Signal Processing Workshop (SAM)*, A Coruña, Jun. 2014, pp. 125-128.

Talks

 - "SONATA: collaborative statistical learning over networks," *Electrical and Computer Engineering Department, University of Virginia, Feb. 2019.*

- "Achieving geometric convergence for distributed asynchronous optimization," *the 23rd International Symposium on Mathematical Programming, Jul. 2018*.

- "ASY-SONATA: achieving geometric convergence for distributed asynchronous optimization," *INFORMS Optimization Society Conference, Mar. 2018*.

- "Distributed nonconvex optimization for sparse representation," *the 42nd IEEE International Conference on Acoustics, Speech, and Signal Processing, Mar. 2017*.

- "Distributed nonconvex multiagent optimization over time-varying networks," *the IEEE Asilomar Conference on Signals, Systems, and Computers, Nov. 2016*.

- "Robust estimation of structured covariance matrix for heavy-tailed distributions," *the 40th IEEE International Conference on Acoustics, Speech, and Signal Processing, Apr. 2015*.

- "Regularized robust estimation of mean and covariance matrix under heavy tails and outliers," *the 8th IEEE Sensor Array and Multichannel Signal Processing Workshop, Jun. 2014*.

Teaching

Graduate courses

- Teaching Assistant, ELEC 6910J *Error Control Coding* (instructor: Prof. E. Sanvicenet), Spring, 2013.

- Teaching Assistant, ELEC 5470 *Convex Optimization* (instructor: Prof. D. P. Palomar), Fall, 2014.

Undergraduate courses

- Teaching Assistant, ELEC 3100 *Signal Processing and Communications* (instructor: Prof. D. P. Palomar)

- Teaching Assistant, ELEC 2200 *Digital Circuits and Systems* (instructor: Prof. L. Yobas)

Academic Society Activities

- Technical program committee member, GlobalSIP 2019, GlobalSIP 2018.

- Reviewer for

  - IEEE Transactions on Automatic Control
  - IEEE Transactions on Signal Processing
  - IEEE Journal of Selected Topics in Signal Processing
  - IEEE Transactions on Signal and Information Processing over Networks
  - IEEE Transactions on Network Science and Engineering
  - Signal Processing
  - Optimization and Engineering
  - GlobalSIP 2019, CDC 2019, GlobalSIP 2018, CDC 2018, SAM 2018, IEEE CAMSAP 2017, IEEE ITW 2017, IEEE ITW 2013, ISIT 2013