Kabir Aladin Verchand (né Chandrasekher)

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Work Experience

Postdoctoral scholar jointly supervised by Ashwin Pananjady and Richard Samworth:

- **Gary C. Butler Family Postdoctoral Fellow,** Schools of Industrial and Systems Engineering and Electrical and Computer Engineering, Georgia Institute of Technology, 2024–
- **Research associate (postdoc),** Statistical Laboratory, University of Cambridge, 2023–2024

Education

Stanford University
Ph.D., Electrical Engineering, 2017–2023
Advisor: Andrea Montanari
Thesis title: Some results in high dimensional statistics: Iterative algorithms and regression with missing data

University of California, Berkeley
B.S., Electrical Engineering and Computer Science, May 2017
Advisors: Kannan Ramchandran and Jean Walrand

Research Interests

High-dimensional statistics, optimization, missing data, statistical-computational tradeoffs

Honors and Awards

- **2022** Runner up: Best paper prize for young researchers in continuous optimization. Awarded once every three years at the International Conference on Continuous Optimization (ICCOPT) hosted by the Mathematical Optimization Society.
- **2017** Stanford Graduate Fellowship (SGF). Awarded annually to 100 students university-wide.
- **2017** NSF Graduate Research Fellowship.
- **2017** UC Berkeley EECS Outstanding Graduate Student Instructor/Distinguished GSI Award (one out of three recipients).
- **2017** UC Berkeley Outstanding Graduate Student Instructor Award. Awarded annually to 200 instructors university-wide.
- **2013** UC Berkeley Regents' and Chancellor's Scholar. Awarded to 200 of 9000 incoming students annually.

Journal papers and preprints

1. Ma, T., **Verchand, K.A.**, Berrett, T.B., Wang, T., Samworth, R.J. 2024. Estimation beyond Missing (Completely) at Random.
2. **Verchand, K.A.**, Montanari, A. 2024. High-dimensional logistic regression with missing data: Imputation, regularization, and universality.
3. Ma, T., **Verchand, K.A.**, Samworth, R.J. 2024. High-probability minimax lower bounds. *Submitted to Annals of Statistics.*
4. Lou, M., **Verchand, K.A.**, Pananjady, A. 2024. Hyperparameter tuning via trajectory predictions: Stochastic prox-linear methods in matrix sensing. *Submitted to Mathematical Programming, Series B.*
    - Preliminary version at Workshop on High-dimensional Learning Dynamics, ICML 2023 (Oral).
5. **Chandrasekher, K.A.**, Lou, M., Pananjady, A. 2024. Alternating minimization for generalized rank one matrix sensing: Sharp predictions from a random initialization. *Information and Inference: A Journal of the IMA (to appear).*
6. **Chandrasekher, K.A.**, Pananjady, A., Thrampoulidis, C. 2023. Sharp global con-

vergence guarantees for iterative nonconvex optimization with random data. *Annals of Statistics.*

- Runner up: Young researchers prize in continuous optimization, Mathematical Optimization Society

7. Lee, K., **Chandrasekher, K.A.**, Pedarsani, R., Ramchandran, K. 2019. SAFFRON: A Fast, Efficient, and Robust Framework for Group Testing based on Sparse-Graph Codes. *IEEE Transactions on Signal Processing.*

Conference papers

1. Mardia, J., **Verchand, K.A.**, Wein, A.S. 2024. Low-degree phase transitions for detecting a planted clique in sublinear time. *Conference on Learning Theory (COLT)*
2. **Chandrasekher, K.A.**, Lou, M., Pananjady, A. 2024. Alternating minimization for generalized rank one matrix sensing: Sharp predictions from a random initialization. *Algorithmic Learning Theory (ALT).* Extended abstract, superseded by journal version.
   - Preliminary version at Workshop on The Benefits of Higher-Order Optimization in Machine Learning, Neurips 2022 (Oral).
3. Cheng, G., **Chandrasekher, K.A.**, Walrand, J. 2019. Static and Dynamic Appointment Scheduling with Stochastic Gradient Descent. *American Control Conference (ACC).*
4. Lazar, D., **Chandrasekher, K.A.**, Pedarsani, R., Sadigh, D. 2018. Maximizing Road Capacity Using Cars that Influence People. *Proceedings of the IEEE Conference on Decision and Control (CDC)*
5. **Chandrasekher, K.A.**, Ocal, O., Ramchandran, K. 2017. Density evolution on a class of smeared random graphs. *Proceedings of the IEEE International Symposium on Information Theory (ISIT).*
6. **Chandrasekher, K.A.**, Lee, K., Kairouz, P., Pedarsani, R., Ramchandran, K. 2017. Asynchronous and noncoherent neighbor discovery for the IoT using sparse-graph codes. *Proceedings of the IEEE International Conference on Communications (ICC)*

Working papers and technical reports

1. Celentano, M., **Verchand, K.A.**, Pananjady, A. 2024. Rigorous state evolution predictions for the trajectory of iterative algorithms beyond first order methods.
2. **Chandrasekher, K.A.**, El Alaoui, A., Montanari, A. 2020. Imputation for High-Dimensional Regression. *ArXiv e-prints, abs/2001.09180.*
3. Mardia, J., Asi, H., **Chandrasekher, K.A.** 2020. Finding Planted Cliques in Sublinear Time. *ArXiv e-prints, abs/2004.12002.*

Teaching

University of Cambridge
Supervisor

- Probability and Measure, Michaelmas (Fall) 2023

Stanford University
Instructor

- EE178: Probabilistic Systems Analysis, Fall 2022

Teaching Assistant

- EE378B: Inference, Estimation, and Information Processing, Spring 2019
- EE178: Probabilistic Systems Analysis, Spring 2020, Spring 2021, Spring 2022, Spring 2023

University of California, Berkeley
Teaching Assistant

- EE126: Probability and Random Processes, Spring 2016, Spring 2017

Talks and Presentations

Invited talks:

1. (*Upcoming*) Joint Statistical Meetings (JSM) session on "Imperfect data, con-

strained algorithms", Nashville, August 2025.

2. (*Upcoming*) Oberwolfach workshop on "Frontiers of Statistics and Machine Learning", Oberwolfach, March 2025.
3. (*Upcoming*) Heidelberg-Paris Workshop on Mathematical Statistics, Heidelberg, January 2025.
4. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Gatsby Computational Neuroscience Unit, University College London, July 2024.
5. "Mean estimation with missing data: Departures from missing completely at random", Workshop on heterogeneous and distributed data, University of Warwick, June 2024.
6. "Hyperparameter tuning via trajectory predictions: Stochastic prox-linear methods in matrix sensing", International Zurich Seminar on Communications (IZS), Zurich, March 2024.
7. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", ESSEC working group on risk, Paris, Feb. 2024.
8. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Information theory seminar, University of Cambridge, Oct. 2023.
9. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Youth in High Dimensions, International Centre for Theoretical Physics (ICTP), Trieste, Italy, May 2023.
10. "Alternating minimization for generalized rank one matrix sensing", Workshop on Fast Optimization Algorithms in the Big Data Era, Institute for Mathematical Sciences (IMS), Singapore, Dec. 2022.
11. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Probability seminar, UC Davis, Oct. 2022.
12. "Alternating minimization for generalized rank one matrix sensing", International Conference on Continuous Optimization (ICCOPT), Lehigh University, July 2022.
13. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Geometric Methods in Optimization and Sampling Seminar, Simons Institute, UC Berkeley, Dec. 2021.

Contributed and other research presentations:

1. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Young Researchers Workshop, Cornell University, Oct. 2024. (Poster)
2. "Low-degree phase transitions for detecting a planted clique in sublinear time". Conference on Learning Theory (COLT), Edmonton, July 2024.
3. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Information Theory and Applications (ITA), San Diego, Feb. 2024.
4. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", International Conference on Statistics and Data Science (ICSDS), Lisbon, Dec. 2023.
5. "Alternating minimization for generalized rank one matrix sensing", Neurips Workshop on The Benefits of Higher-Oorder Optimization in Machine Learning, New Orleans, Dec. 2022. *Spotlight presentation.*

6. "Sharp global convergence guarantees for iterative nonconvex optimization with random data", Theory of Computing Associated–Silicon Valley, Stanford, May 2022. (Poster)
7. "Imputation for high-dimensional linear regression", Workshop on Missing Data Challenges in Computation, Statistics, and Applications, Institute for Advanced Study (IAS), Sep. 2020. (Poster)
8. "Imputation for high-dimensional linear regression", Theory of Computing Associated–Silicon Valley, Stanford, Nov. 2019. (Poster)

Graduate student mentorship

- Tianyi Ma (University of Cambridge). Resulted in papers "High-probability minimax lower bounds" and "Estimation beyond Missing (Completely) at Random".
- Mengqi Lou (Georgia Institute of Technology). Resulted in papers "Alternating minimization for generalized rank one matrix sensing: Sharp predictions from a random initialization" and "Hyperparameter tuning via trajectory predictions: Stochastic prox-linear methods in matrix sensing".

Service

- *Organizer of* Stanford Information Systems Laboratory Colloquium (2018–2023)
- *Program committee for* Conference on Learning Theory (COLT): 2022, 2023, 2024
- *Journal reviewer for* Annals of Statistics, Statistical Science, IEEE Transactions on Information Theory, Journal of Machine Learning Research (JMLR), IEEE Transactions on Signal Processing, IEEE Control Systems Letters
- *Conference reviewer for* International Conference on Learning Representations (ICLR), Conference on Neural Information Processing Systems (Neurips), International Symposium on Information Theory (ISIT), Information Theory Workshop (ITW)

References

- Professor Andrea Montanari. Professor, Departments of Mathematics and Statistics, Stanford University. Email: montanari@stanford.edu
- Professor Ashwin Pananjady. Assistant Professor, Schools of Industrial & Systems Engineering and Electrical & Computer Engineering, Georgia Institute of Technology. Email: ashwinpm@gatech.edu
- Professor Richard Samworth. Professor, Department of Pure Mathematics & Mathematical Statistics, University of Cambridge. Email: rjs57@cam.ac.uk
- Professor Abbas El Gamal. Professor, Department of Electrical Engineering, Stanford University. Email: abbas@ee.stanford.edu