

CONTACT INFORMATION	University of California, Berkeley Department of Statistics and International Computer Science Institute <i>Phone:</i> (773) 580-6556 <i>Email:</i> senna@berkeley.edu <i>Website:</i> https://senna1128.github.io	
RESEARCH INTERESTS	High-dimensional estimation & inference Graphical models & Semiparametric models Large-scale stochastic optimization Uncertainty quantification Optimal control AI for Science: applications in biology, neuroscience, physics and engineering	
ACADEMIC APPOINTMENT	University of California, Berkeley , Berkeley, California USA Department of Statistics and International Computer Science Institute Postdoctoral Scholar Advisor: Prof. Michael W. Mahoney	September 2021 - present
EDUCATION	University of Chicago , Chicago, Illinois USA Ph.D. in Statistics (GPA 4.0/4.0) Thesis: Towards Solving Long-Horizon Nonlinear Dynamic Programs: Scalability and Robustness Advisors: Prof. Mihai Anitescu and Prof. Mladen Kolar Nanjing University , Nanjing, Jiangsu China B.S. in Mathematics (GPA 3.9/4.0, rank 1/120) Thesis: A Stochastic Semi-Proximal-Based Peaceman-Rachford Splitting Method University of California, Davis , Davis, California USA Department of Statistics, exchange student (GPA 4.0/4.0)	August 2016 - July 2021 September 2012 - June 2016 March 2015 - September 2015
RESEARCH EXPERIENCE	Argonne National Laboratory , Lemont, Illinois USA Mathematics and Computer Science Division Givens Associate in 2018, 2019, and W.J. Cody Associate in 2020 <i>Projects:</i> sensitivity analysis of nonlinear dynamic programs, convergence analysis of online model predictive control, convergence analysis of offline temporal decomposition procedure, applications on power grids and energy systems, implementation of Julia/JuMP, IPOPT, etc.	June - Sept., 2018, 2019, 2020
TEACHING EXPERIENCE	University of Chicago, Department of Statistics Teaching Assistant <ul style="list-style-type: none"> • STAT376 Machine Learning and Large-Scale Data Analysis • STAT315 Stochastic Simulation • STAT244 Statistical Theory and Methods 	Spring 2020 Spring 2019 Autumn 2017

HONORS AND
AWARDS

SDSS Student & Early Career Award , ASA	2023
Harper Dissertation Fellowship , University of Chicago (one of the highest honors at UChicago in recognition of Ph.D. candidates' record of achievement and professional promise.)	2020
Bao-steel Scholarship , Nanjing University (one of the highest national honors given to undergraduate students for academic performance.)	2016
Outstanding Graduate , Nanjing University	2016
Exchange Program Scholarship , University of California, Davis	2015
Electronics Technology Scholarship , Nanjing University	2014
Aolei Scholarship , Nanjing University	2013

PUBLICATIONS
(CHRONOLOGICAL
ORDER)

- [16] Constrained Optimization via Exact Augmented Lagrangian and Randomized Iterative Sketching
I. Hong, **S. Na**, M. W. Mahoney, and M. Kolar (IH and SN have equal contribution)
International Conference on Machine Learning, 2023 [Preprint](#)
- [15] A Fast Temporal Decomposition Procedure for Long-horizon Nonlinear Dynamic Programming
S. Na, M. Anitescu, and M. Kolar
Mathematics of Operations Research, 2023 [DOI: 10.1287/moor.2023.1378](#)
- [14] Inequality Constrained Stochastic Nonlinear Optimization via Active-Set Sequential Quadratic Programming
S. Na, M. Anitescu, and M. Kolar
Mathematical Programming, 2023 [DOI: 10.1007/s10107-023-01935-7](#)
- [13] Hessian averaging in stochastic Newton methods achieves superlinear convergence
S. Na, M. Dereziński, and M. W. Mahoney
Mathematical Programming, 2022 [DOI: 10.1007/s10107-022-01913-5](#)
- [12] An adaptive stochastic sequential quadratic programming with differentiable exact augmented lagrangians
S. Na, M. Anitescu, and M. Kolar
Mathematical Programming, 2022 [DOI: 10.1007/s10107-022-01846-z](#)
- [11] Superconvergence of Online Optimization for Model Predictive Control
S. Na and M. Anitescu
IEEE Transactions on Automatic Control, 2022 [DOI: 10.1109/tac.2022.3223323](#)
- [10] On the Convergence of Overlapping Schwarz Decomposition for Nonlinear Optimal Control
S. Na, S. Shin, M. Anitescu, and V. M. Zavala (SN and SS have equal contribution)
IEEE Transactions on Automatic Control, 2022 [DOI: 10.1109/tac.2022.3194087](#)
- [9] SFGAE: a self-feature-based graph autoencoder model for miRNA–disease associations prediction
M. Ma, **S. Na**, X. Zhang, C. Chen, and J. Xu
Briefings in Bioinformatics, 2022 [DOI: 10.1093/bib/bbac340](#)
- [8] Global Convergence of Online Optimization for Nonlinear Model Predictive Control
S. Na
Advances in Neural Information Processing Systems, 2021 [Preprint](#)
- [7] High-dimensional index volatility models via Stein's identity
S. Na and M. Kolar
Bernoulli, 27(2): p. 794–817, 2021 [DOI: 10.3150/20-bej1238](#)
- [6] AEGCN: An Autoencoder-Constrained Graph Convolutional Network
M. Ma, **S. Na**, and H. Wang

Neurocomputing, 432: p. 21–31, 2021 DOI: [10.1016/j.neucom.2020.12.061](https://doi.org/10.1016/j.neucom.2020.12.061)

- [5] The graph-based behavior-aware recommendation for interactive news
M. Ma, **S. Na**, H. Wang, C. Chen, and J. Xu
Applied Intelligence, 52(2): p. 1913–1929, 2021 DOI: [10.1007/s10489-021-02497-x](https://doi.org/10.1007/s10489-021-02497-x)
- [4] Estimating differential latent variable graphical models with applications to brain connectivity
S. Na, M. Kolar, and O. Koyejo
Biometrika, 108(2): p. 425–442, 2020 DOI: [10.1093/biomet/asaa066](https://doi.org/10.1093/biomet/asaa066)
- [3] Exponential Decay in the Sensitivity Analysis of Nonlinear Dynamic Programming
S. Na and M. Anitescu
SIAM Journal on Optimization, 30(2): p. 1527–1554, 2020 DOI: [10.1137/19m1265065](https://doi.org/10.1137/19m1265065)
- [2] Semiparametric Nonlinear Bipartite Graph Representation Learning with Provable Guarantees
S. Na, Y. Luo, Z. Yang, Z. Wang, and M. Kolar
International Conference on Machine Learning, 2020 Preprint
- [1] High-dimensional Varying Index Coefficient Models via Stein’s Identity
S. Na, Z. Yang, Z. Wang, and M. Kolar
Journal of Machine Learning Research, 20(152): p. 1–44, 2019 Preprint
- ** Towards Solving Long-Horizon Nonlinear Dynamic Programs: Scalability and Robustness
S. Na
University of Chicago (PhD Thesis), 2021

TECHNICAL
REPORTS (UNDER
REVIEW)

- [4] Fully Stochastic Trust-Region Sequential Quadratic Programming for Equality-Constrained Optimization Problems
Y. Fang, **S. Na**, M. W. Mahoney, and M. Kolar
arXiv preprint arXiv:2211.15943, 2022 Preprint
- [3] Near-Optimal Performance of Stochastic Predictive Control
S. Shin, **S. Na**, and M. Anitescu
arXiv preprint arXiv:2210.08599, 2022 Preprint
- [2] Statistical Inference of Constrained Stochastic Optimization via Sketched Sequential Quadratic Programming
S. Na and M. W. Mahoney
arXiv preprint arXiv:2205.13687, 2022 Preprint
- [1] Convergence Analysis of Accelerated Stochastic Gradient Descent under the Growth Condition
Y.-L. Chen, **S. Na**, and M. Kolar
arXiv preprint arXiv:2006.06782, 2020 Preprint

WORKING PAPERS
(AVAILABLE UPON
REQUEST)

- [2] Y. Fang, **S. Na**, M. W. Mahoney, and M. Kolar. Trust-Region Sequential Quadratic Programming for Stochastic Optimization with Random Models. 2023+ (A short draft is accepted by NeurIPS Higher-Order Optimization in Machine Learning (HOO) workshop, 2022)
- [1] M. Li, **S. Na**, and M. Kolar. Exact Augmented Lagrangian on Manifold Optimization. 2023+

TALKS

- [6] INFORMS Annual Meeting Phoenix, Oct. 2023
- [5] SIAM Conference on Optimization Seattle, May 2023
- [4] Symposium on Data Science & Statistics (referred) St. Louis, May 2023
- [3] Advances in Neural Information Processing Systems Virtual, Dec. 2021
- [2] International Conference on Machine Learning Virtual, July 2020
- [1] Summer Student Mini-Symposium, Argonne National Laboratory Lemont, Sept. 2018-2020

PROFESSIONAL
SERVICE

Referee Service

I have served as a referee for several prestigious journals in the fields of mathematics and statistics, including:

- SIAM Journal on Optimization
- Mathematics of Operations Research
- IMA Journal of Numerical Analysis
- Journal of Machine Learning Research
- Electronic Journal of Statistics
- Statistics & Probability Letters

Reviewer of conferences: NeurIPS, ICML, ICLR, IJCAI, AISTats etc.

Organizer of conference sessions: SIAM Conference on Optimization, INFORMS Annual Meeting

Mentoring Experience

I am fortunate to supervise self-motivated junior students on various research problems

- Xiaoran Chen (UChicago, Stat, MS), Yang Chu (Berkeley, Stat, PhD), Yuchen Fang (UChicago, CAM, MS), Yihang Gao (HKU, Math, PhD), Ilgee Hong (UChicago, Stat, MS), Simiao Jiao (UChicago, Stat, MS), Wei Kuang (UChicago, Stat, PhD), Miao Li (UChicago, CAM, MS), Heming Liu (UChicago, Stat, MS), Xiaoyu Niu (Berkeley, Math, PhD)

SKILLS

Programming Languages

- Matlab, Python, Julia, R, Git, Linux Shell

Languages

- Native: Mandarin, Chinese
- Fluent: English

ACTIVITIES

Professional ping pong player until ninth grade

Recreation: soccer, hiking, walking the dog, road tripping

REFERENCES

Provided upon request