

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 and inference Probabilistic graphical models Semiparametric models Large-scale stochastic optimization Uncertainty quantification Optimal control Scientific applications in biology, neuroscience, and engineering
EDUCATION	<div> University of Chicago, Chicago, Illinois USA August 2016 - July 2021 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 </div> <div> Nanjing University, Nanjing, Jiangsu China September 2012 - June 2016 B.S. in Mathematics (GPA 3.9/4.0, rank 1/120) Thesis: A Stochastic Semi-Proximal-Based Peaceman-Rachford Splitting Method </div> <div> University of California, Davis, Davis, California USA March 2015 - September 2015 Department of Statistics, exchange student (GPA 4.0/4.0) </div>
ACADEMIC APPOINTMENT	University of California, Berkeley , Berkeley, California USA September 2021 - present Department of Statistics and International Computer Science Institute Postdoctoral Scholar Advisor: Prof. Michael W. Mahoney
RESEARCH EXPERIENCE	Argonne National Laboratory , Lemont, Illinois USA June - Sept., 2018, 2019, 2020 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.
TEACHING EXPERIENCE	University of Chicago, Department of Statistics Teaching Assistant <ul style="list-style-type: none"> • STAT376 Machine Learning and Large-Scale Data Analysis Spring 2020 • STAT315 Stochastic Simulation Spring 2019 • STAT244 Statistical Theory and Methods Autumn 2017

HONORS AND
AWARDS

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)

- [14] Inequality Constrained Stochastic Nonlinear Optimization via Active-Set Sequential Quadratic Programming
S. Na, M. Anitescu, and M. Kolar
To appear in Mathematical Programming, 2023 DOI: [10.1007/s10107-023-01935-7](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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)

	<p>[3] Exponential Decay in the Sensitivity Analysis of Nonlinear Dynamic Programming S. Na and M. Anitescu <i>SIAM Journal on Optimization</i>, 30(2): p. 1527–1554, 2020 DOI: 10.1137/19m1265065</p> <p>[2] Semiparametric Nonlinear Bipartite Graph Representation Learning with Provable Guarantees S. Na, Y. Luo, Z. Yang, Z. Wang, and M. Kolar <i>International Conference on Machine Learning</i>, 2020 Preprint</p> <p>[1] High-dimensional Varying Index Coefficient Models via Stein’s Identity S. Na, Z. Yang, Z. Wang, and M. Kolar <i>Journal of Machine Learning Research</i>, 20(152): p. 1–44, 2019 Preprint</p> <p>** Towards Solving Long-Horizon Nonlinear Dynamic Programs: Scalability and Robustness S. Na <i>University of Chicago (PhD Thesis)</i>, 2021</p>
TECHNICAL REPORTS (UNDER REVIEW)	<p>[5] Fully Stochastic Trust-Region Sequential Quadratic Programming for Equality-Constrained Optimization Problems Y. Fang, S. Na, M. W. Mahoney, and M. Kolar <i>arXiv preprint arXiv:2211.15943</i>, 2022 Preprint</p> <p>[4] Near-Optimal Performance of Stochastic Predictive Control S. Shin, S. Na, and M. Anitescu <i>arXiv preprint arXiv:2210.08599</i>, 2022 Preprint</p> <p>[3] Asymptotic Convergence Rate and Statistical Inference for Stochastic Sequential Quadratic Programming S. Na and M. W. Mahoney <i>arXiv preprint arXiv:2205.13687</i>, 2022 Preprint</p> <p>[2] A Fast Temporal Decomposition Procedure for Long-horizon Nonlinear Dynamic Programming S. Na, M. Anitescu, and M. Kolar <i>arXiv preprint arXiv:2107.11560</i>, 2021 Preprint</p> <p>[1] Convergence Analysis of Accelerated Stochastic Gradient Descent under the Growth Condition Y.-L. Chen, S. Na, and M. Kolar <i>arXiv preprint arXiv:2006.06782</i>, 2020 Preprint</p>
WORKING PAPERS (AVAILABLE UPON REQUEST)	<p>[3] I. Hong, S. Na, M. W. Mahoney, and M. Kolar. Constrained Optimization via Exact Augmented Lagrangian and Randomized Iterative Sketching. 2023+ (A short draft is accepted by NeurIPS OPT workshop, 2022)</p> <p>[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)</p> <p>[1] M. Li, S. Na, and M. Kolar. Exact Augmented Lagrangian on Manifold Optimization. 2023+</p>
TALKS	<p>[5] SIAM Conference on Optimization Seattle, May 2023</p> <p>[4] Symposium on Data Science & Statistics (referred) St. Louis, May 2023</p> <p>[3] Advances in Neural Information Processing Systems Virtual, Dec. 2021</p> <p>[2] International Conference on Machine Learning Virtual, July 2020</p> <p>[1] Summer Student Mini-Symposium, Argonne National Laboratory Lemont, Sept. 2018-2020</p>
PROFESSIONAL SERVICE	<p><i>Referee Service</i></p> <p>I actively serve as a reliable referee for journals of mathematics and statistics, such as</p>

- Mathematical Programming
- SIAM Journal on Optimization
- 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

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