

CONTACT INFORMATION	<p>University of California, Berkeley  Department of Statistics and  International Computer Science Institute  <i>Phone:</i> (773) 580-6556  <i>Email:</i> <a href="mailto:senna@berkeley.edu">senna@berkeley.edu</a>  <i>Website:</i> <a href="https://senna1128.github.io">https://senna1128.github.io</a></p>
RESEARCH INTERESTS	<p>High-dimensional estimation &amp; inference  Graphical models &amp; Semiparametric models  Large-scale stochastic optimization  Uncertainty quantification  Optimal control  AI for Science: applications in biology, neuroscience, physics and engineering</p>
ACADEMIC APPOINTMENT	<p><b>University of California, Berkeley</b>, Berkeley, California USA      September 2021 - present  Department of Statistics and International Computer Science Institute  Postdoctoral Scholar  Advisor: Prof. <a href="#">Michael W. Mahoney</a></p>
EDUCATION	<p><b>University of Chicago</b>, 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. <a href="#">Mihai Anitescu</a> and Prof. <a href="#">Mladen Kolar</a>  Committee members: Prof. <a href="#">Lek-Heng Lim</a> and Prof. <a href="#">Tengyuan Liang</a></p> <p><b>Nanjing University</b>, 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</p> <p><b>University of California, Davis</b>, Davis, California USA      March 2015 - September 2015  Department of Statistics, exchange student (GPA 4.0/4.0)</p>
RESEARCH EXPERIENCE	<p><b>Argonne National Laboratory</b>, 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.</p>
TEACHING EXPERIENCE	<p><b>University of Chicago, Department of Statistics</b>  Teaching Assistant</p> <ul style="list-style-type: none"> <li>• STAT376 Machine Learning and Large-Scale Data Analysis      Spring 2020</li> <li>• STAT315 Stochastic Simulation      Spring 2019</li> </ul>

- STAT245 Statistical Theory and Methods (II) Winter 2021
- STAT244 Statistical Theory and Methods (I) Autumn 2017
- STAT234 Statistical Models and Methods Spring 2017, Winter 2017, Winter 2018

HONORS AND  
AWARDS

- ORIE Young Researcher**, Cornell University 2023
- SDSS Student & Early Career Award**, ASA 2023
- Harper Dissertation Fellowship**, University of Chicago 2020  
(one of the highest honors at UChicago in recognition of Ph.D. candidates' record of achievement and professional promise.)
- Bao-steel Scholarship**, Nanjing University 2016  
(one of the highest national honors given to undergraduate students for academic performance.)
- 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](#)
- [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](#)
- [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](#)
- [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](#)
- [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)

- [5] Y. Gao, **S. Na**, and M. W. Mahoney. An Asymptotically Optimal Method for Constrained Stochastic Optimization. 2023+ (presented in the International Council for Industrial and Applied Mathematics)
- [4] Y. Fang, **S. Na**, M. W. Mahoney, and M. Kolar. Trust-Region Sequential Quadratic Programming for Stochastic Optimization with Random Models. 2023+ (accepted in part in the NeurIPS workshop, 2022)
- [3] R. Ni, **S. Na**, S. Shin, and M. Anitescu. Fast overlapping decomposition for graph-structured nonlinear programs. 2023+
- [2] W. Kuang, **S. Na**, M. W. Mahoney, and M. Anitescu. Online covariance matrix estimation in stochastic Newton methods. 2023+

	[1] M. Li, <b>S. Na</b> , and M. Kolar. Exact Augmented Lagrangian on Manifold Optimization. 2023+	
TALKS	[8] INFORMS Annual Meeting	Phoenix, Oct. 2023
	[7] Cornell ORIE Young Researchers Workshop	Cornell, Oct. 2023
	[6] International Conference on Machine Learning	Honolulu, July 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	<i>Referee Service</i> I have served as a referee for several prestigious journals in the fields of mathematics and statistics, including: <ul style="list-style-type: none"> <li>• SIAM Journal on Optimization</li> <li>• Mathematics of Operations Research</li> <li>• IMA Journal of Numerical Analysis</li> <li>• Journal of Machine Learning Research</li> <li>• Electronic Journal of Statistics</li> <li>• Statistics &amp; Probability Letters</li> </ul> <i>Reviewer of conferences:</i> NeurIPS, ICML, ICLR, IJCAI, AISTats etc. <i>Organizer of conference sessions:</i> SIAM Conference on Optimization, INFORMS Annual Meeting <i>Mentoring Experience</i> I am fortunate to supervise self-motivated junior students on various research problems <ul style="list-style-type: none"> <li>• 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)</li> </ul>	
SKILLS	<i>Programming Languages</i> <ul style="list-style-type: none"> <li>• Matlab, Python, Julia, R, Git, Linux Shell</li> </ul> <i>Languages</i> <ul style="list-style-type: none"> <li>• Native: Mandarin, Chinese</li> <li>• Fluent: English</li> </ul>	
ACTIVITIES	Professional ping pong player until ninth grade Recreation: soccer, hiking, walking the dog, road tripping	
REFERENCES	<b>Provided upon request</b>	