

## Bryan He

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- CONTACT INFORMATION** Stanford University  
Department of Computer Science  
353 Serra Mall  
Stanford, CA 94305 USA  
*Email:* bryanhe@cs.stanford.edu  
*Website:* ai.stanford.edu/~bryanhe
- EDUCATION** **Stanford University**, Stanford, CA  
Ph.D., Computer Science, June 2023  
Dissertation: Development and Deployment of Machine Learning in Medicine  
Advisor: James Zou  
Funded by the National Science Foundation Graduate Research Fellowship  
**California Institute of Technology**, Pasadena, CA  
B.S. with honors, Computer Science, June 2015  
Thesis: Smooth Interactive Submodular Set Cover  
Advisor: Yisong Yue
- SELECTED PUBLICATIONS** **Blinded, randomized trial of sonographer versus AI cardiac function assessment.**  
Bryan He, Alan C. Kwan, Jae Hyung Cho, Neal Yuan, Charles Pollick, Takahiro Shiota, Joseph Ebinger, Natalie A. Bello, Janet Wei, Kiranbir Josan, Grant Duffy, Melvin Jujjavarapu, Robert Siegel, Susan Cheng, James Y. Zou, and David Ouyang.  
*Nature* (2023).  
**Integrating spatial gene expression and breast tumour morphology via deep learning.**  
Bryan He, Ludvig Bergenstråhle, Linnea Stenbeck, Abubakar Abid, Alma Andersson, Åke Borg, Jonas Maaskola, Joakim Lundeberg, and James Zou.  
*Nature Biomedical Engineering* (2020).  
**Video-based AI for beat-to-beat assessment of cardiac function.**  
David Ouyang, Bryan He, Amirata Ghorbani, Neal Yuan, Joseph Ebinger, Curtis P. Langlotz, Paul A. Heidenreich, Robert A. Harrington, David H. Liang, Euan A. Ashley, and James Y. Zou.  
*Nature* (2020).
- PUBLICATIONS** **Video-based deep learning for automated assessment of left ventricular ejection fraction in pediatric patients.**  
Charitha D. Reddy, Leo Lopez, David Ouyang, James Y. Zou, and Bryan He.  
*Journal of the American Society of Echocardiography* (2023).  
**Blinded, randomized trial of sonographer versus AI cardiac function assessment.**  
Bryan He, Alan C. Kwan, Jae Hyung Cho, Neal Yuan, Charles Pollick, Takahiro Shiota, Joseph Ebinger, Natalie A. Bello, Janet Wei, Kiranbir Josan, Grant Duffy, Melvin Jujjavarapu, Robert Siegel, Susan Cheng, James Y. Zou, and David Ouyang.  
*Nature* (2023).  
**AI-enabled assessment of cardiac function and video quality in emergency department point-of-care echocardiograms.**  
Bryan He, Dev Dash, Youyou Duanmu, Ting Xu Tan, David Ouyang, and James Zou.  
*Journal of Emergency Medicine* (2023).  
**Confounders mediate AI prediction of demographics in medical imaging.**  
Grant Duffy, Shoa L. Clarke, Matthew Christensen, Bryan He, Neal Yuan, Susan Cheng, and David Ouyang.  
*npj Digital Medicine* (2022).

**AI-enabled in silico immunohistochemical characterization for Alzheimer’s disease.**  
Bryan He, Syed Bukhari, Edward Fox, Abubakar Abid, Jeanne Shen, Claudia Kawas, Maria Corrada, Thomas Montine, and James Zou.  
*Cell Reports Methods* (2022).

**High-throughput precision phenotyping of left ventricular hypertrophy with cardiovascular deep learning.**  
Grant Duffy, Paul P Cheng, Neal Yuan, Bryan He, Alan C Kwan, Matthew J Shun-Shin, Kevin M Alexander, Joseph Ebinger, Matthew P Lungren, Florian Rader, David H Liang, Ingela Schnittger, Euan A Ashley, James Y Zou, Jignesh Patel, Ronald Witteles, Susan Cheng, and David Ouyang.  
*JAMA Cardiology* (2022).

**Super-resolved spatial transcriptomics by deep data fusion.**  
Ludvig Bergenstråhle, Bryan He, Joseph Bergenstråhle, Xesús Abalo, Reza Mirzazadeh, Kim Thrane, Andrew L Ji, Alma Andersson, Ludvig Larsson, Nathalie Stakenborg, Guy Boeckxstaens, Paul Khavari, James Zou, Joakim Lundeberg, and Jonas Maaskola.  
*Nature Biotechnology* (2022).

**Interpretable deep learning prediction of 3D assessment of cardiacfunction.**  
Grant Duffy, Ishan Jain, Bryan He, and David Ouyang.  
*Pacific Symposium on Biocomputing* (2022).

**CloudPred: Predicting patient phenotypes from single-cell RNA-seq.**  
Bryan He, Matthew Thomson, Meena Subramaniam, Richard Perez, Chun Jimmie Ye, and James Zou.  
*Pacific Symposium on Biocomputing* (2022).

**Deep learning evaluation of biomarkers from echocardiogram videos.**  
J. Weston Hughes, Neal Yuan, Bryan He, Jiahong Ouyang, Joseph Ebinger, Patrick Botting, Jasper Lee, John Theurer, James E. Tooley, Koen Nieman, Matthew P. Lungren, David H. Liang, Ingela Schnittger, Jonathan H. Chen, Euan A. Ashley, Susan Cheng, David Ouyang, and James Y. Zou.  
*EBioMedicine* (2021).

**Systematic quantification of sources of variation in ejection fraction calculation using deep learning.**  
Neal Yuan, Ishan Jain, Neeraj Rattehalli, Bryan He, Charles Pollick, David Liang, Paul Heidenreich, James Zou, Susan Cheng, and David Ouyang.  
*Cardiovascular Imaging* (2021).

**How to evaluate deep learning for cancer diagnostics—factors and recommendations.**  
Roxana Daneshjou, Bryan He, David Ouyang, and James Y. Zou.  
*Biochimica et Biophysica Acta (BBA) - Reviews on Cancer* (2021).

**Deep learning for biomedical videos: perspective and recommendations.**  
David Ouyang, Zhenqin Wu, Bryan He, and James Zou.  
*Artificial Intelligence in Medicine* (2021).

**Integrating spatial gene expression and breast tumour morphology via deep learning.**  
Bryan He, Ludvig Bergenstråhle, Linnea Stenbeck, Abubakar Abid, Alma Andersson, Åke Borg, Jonas Maaskola, Joakim Lundeberg, and James Zou.  
*Nature Biomedical Engineering* (2020).

**The diversity–innovation paradox in science.**  
Bas Hofstra, Vivek V. Kulkarni, Sebastian Munoz-Najar Galvez, Bryan He, Dan Jurafsky, and Daniel A. McFarland.  
*Proceedings of the National Academy of Sciences* (2020).

**Video-based AI for beat-to-beat assessment of cardiac function.**

David Ouyang, Bryan He, Amirata Ghorbani, Neal Yuan, Joseph Ebinger, Curtis P. Langlotz, Paul A. Heidenreich, Robert A. Harrington, David H. Liang, Euan A. Ashley, and James Y. Zou. *Nature* (2020).

**Deep learning interpretation of echocardiograms.**

Amirata Ghorbani, David Ouyang, Abubakar Abid, Bryan He, Jonathan H. Chen, Robert A. Harrington, David H. Liang, Euan A. Ashley, and James Y. Zou. *npj Digital Medicine* (2020).

**Accelerated stochastic power iteration.**

Peng Xu, Bryan He, Christopher De Sa, Ioannis Mitliagkas, and Chris Ré. *International Conference on Artificial Intelligence and Statistics (AISTATS)* (2018).

**Inferring generative model structure with static analysis.**

Paroma Varma, Bryan D He, Payal Bajaj, Nishith Khandwala, Imon Banerjee, Daniel Rubin, and Christopher Ré. *Advances in Neural Information Processing Systems (NeurIPS)* (2017).

**Learning the structure of generative models without labeled data.**

Stephen H. Bach, Bryan He, Alexander Ratner, and Christopher Ré. *International Conference on Machine Learning (ICML)* (2017).

**Signal quality of endovascular electroencephalography.**

Bryan He, Mosalam Ebrahimi, Leon Palafox, and Lakshminarayan Srinivasan. *Journal of Neural Engineering* (2016).

**Scan order in Gibbs sampling: Models in which it matters and bounds on how much.**

Bryan He, Christopher M. De Sa, Ioannis Mitliagkas, and Christopher Ré. *Advances in Neural Information Processing Systems (NeurIPS)* (2016).

**Generalized analog thresholding for spike acquisition at ultralow sampling rates.**

Bryan He, Alex Wein, Lav R. Varshney, Julius Kusuma, Andrew G. Richardson, and Lakshminarayan Srinivasan. *Journal of Neurophysiology* (2015).

**Smooth interactive submodular set cover.**

Bryan He and Yisong Yue. *Advances in Neural Information Processing Systems (NeurIPS)* (2015).

**Feasibility of FRI-Based Square-Wave Reconstruction with Quantization Error and Integrator Noise.**

Bryan He, Alexander Wein, Lakshminarayan Srinivasan. *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* (2015).

**A simple optimal binary representation of mosaic floorplans and Baxter permutations.**

Bryan He. *Theoretical Computer Science* (2014).

**Dynamic analysis of naive adaptive brain-machine interfaces.**

Kevin C. Kowalski, Bryan He, and Lakshminarayan Srinivasan. *Neural Computation* (2013).

TEACHING

**Artificial Intelligence: Principles and Techniques (CS 221)**, Stanford University  
*Spring 2018*

Teaching Assistant for Professor Dorsa Sadigh

— Received award for outstanding work given to the top 5% of TAs

**Artificial Intelligence: Principles and Techniques (CS 221)**, Stanford University

*Fall 2017*

Teaching Assistant for Professors Percy Liang and Stefano Ermon

**Machine Learning & Data Mining (CS/CNS/EE 155)**, California Institute of Technology

*Winter 2015*

Teaching Assistant for Professor Yisong Yue

**Learning Systems (CS/CNS/EE 156a)**, California Institute of Technology

*Fall 2014*

Teaching Assistant for Professor Yaser Abu-Mostafa

**Learning Systems (CS/CNS/EE 156b)**, California Institute of Technology

*Fall 2014*

Teaching Assistant for Professor Yaser Abu-Mostafa

— Special topics course on recommendation systems and the Netflix Challenge

**Introduction to Programming Methods (CS 2)**, California Institute of Technology

*Winter 2013*

Teaching Assistant for Professors Mathieu Desbrun and Alan Barr

AWARDS AND  
FELLOWSHIPS

**National Science Foundation Graduate Research Fellowship**

— Fellowship for graduate research in science, technology, and engineering, 2015 – 2020

**Bhansali Prize**

— Outstanding undergraduate research in Computer Science, 2015

**Davidson Fellows Scholarship**

— Scholarship for research in technology, 2012

**National Merit Scholarship**

— Scholarship for high scoring students, 2012

**Intel Science Talent Search**

— Finalist, January 2011

REFERENCES

*Professor James Zou*

Stanford University

[jamesz@stanford.edu](mailto:jamesz@stanford.edu)

*Dr. David Ouyang*

Cedars-Sinai Medical Center

[david.ouyang@cshs.org](mailto:david.ouyang@cshs.org)

*Professor Thomas Montine*

Stanford University

[tmontine@stanford.edu](mailto:tmontine@stanford.edu)

*Professor Yisong Yue*

California Institute of Technology

[yyue@caltech.edu](mailto:yyue@caltech.edu)