DAVID M. CHAN

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University of California, Berkeley
Berkeley Way West 8014, Berkeley, CA 94720

EDUCATION

PhD University of California, Berkeley, EECS — Present
Committee: John Canny (chair), Trevor Darrell, Allison Gopnik

MS University of California, Berkeley, EECS — May 2020
Thesis: "GPU-Accelerated T-Distributed Stochastic Neighbor Embedding"
Advisor: John Canny

BSc University of Denver, Computer Science + Mathematics — June 2017
Graduated Summa Cum Laude (4.0 GPA), Honors with Distinction, Phi Beta Kappa

EXPERIENCE

Amazon, San Jose, CA — 2021 to Present
Applied Scientist II (Intern), Alexa AI

- Developed novel multi-modal ASR models improving WER up to 30%
- Worked on cross-discipline teams to develop 10B parameter scale models

Google, Mountain View, CA — Summer 2020
Intern, Google AI

- Designed models for Visual Description on large-scale (> 512 GPU) deployments
- Maintained production pipelines for real-time AI solutions

Dropbox, San Francisco, CA — Summer 2019
Intern, AI Research

- Implemented SOTA ML and AI Algorithms using production data
- Drove feature development by producing models with >90% target accuracy
- Pioneered contrastive-learning feature-based content-analysis pipelines on user data

NASA Jet Propulsion Lab, Pasadena, CA — Summer 2018
Intern, Group 347T (Robotic Aerial Mobility)

- Designed state of the art RL agents for satellite mapping
- Developed cutting edge autonomous scheduling platforms for spacecraft systems
- Designed software architectures for DARPA Sub-T Challenge Winning Team

University of Denver, Denver, CO — 2015-2017
Undergraduate Lecturer

DreamFace Technologies, Denver, CO 2013-2017
Research Assistant

Google, Denver, CO 2014-2016
Student Ambassador

iD Tech Camps, Phoenix, AZ Summer 2014
Instructor

Boettcher Foundation, Denver, CO Summer 2014
Research Assistant

PUBLICATIONS

Conference Publications

Chan, David M., and Shalini Ghosh. "Content-Context Factorized Representations for Automated Speech Recognition." (To appear at INTERSPEECH 2022).

Chan, David M., Shalini Ghosh, Debmalya Chakrabarty, and Björn Hoffmeister. "Multi-Modal Pre-Training for Automated Speech Recognition." In ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 246-250. IEEE, 2022.

Kosoy, Eliza, Adrian Liu, Jasmine L. Collins, **David Chan**, Jessica B. Hamrick, Nan Rosemary Ke, Sandy Huang, Bryanna Kaufmann, John Canny, and Alison Gopnik. "Learning Causal Overhypotheses through Exploration in Children and Computational Models." In First Conference on Causal Learning and Reasoning. 2021.

Chan, David M., Austin Myers, Sudheendra Vijayanarasimhan, David A. Ross, Bryan Seybold, and John F. Canny. "What's in a Caption? Dataset-Specific Linguistic Diversity and Its Effect on Visual Description Models and Metrics." In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, pp. 4740-4749. 2022.

Xue, Bofan, **David Chan,** and John Canny. "A Dataset and Benchmarks for Multimedia Social Analysis" 4th Workshop on Multimedia Learning and Applications (MULA) at CVPR (2020).

Kosoy, Eliza, Jasmine Collins, **David M. Chan,** Jessica B. Hamrick, Sandy Huang, Alison Gopnik, and John F. Canny. "Exploring Exploration: Comparing Children with RL Agents in Unified Environments." BAICS Workshop at ICLR (2020).

Chan, David M., Sudheendra Vijayanarasimhan, David A. Ross, and John F. Canny. "Active Learning for Video Description With Cluster-Regularized Ensemble Ranking." In Proceedings of the Asian Conference on Computer Vision. 2020.

Seita, Daniel, **David M. Chan,** Roshan Rao, Chen Tang, Mandi Zhao, and John F. Canny. "ZPD Teaching Strategies for Deep Reinforcement Learning from Demonstrations." In Deep Reinforcement Learning Workshop at Neural Information Processing Systems (NeurIPS), (2019).

Chan, David M., and Ali-akbar Agha-mohammadi. "Autonomous imaging and mapping of small bodies using deep reinforcement learning." In 2019 IEEE Aerospace Conference, pp. 1-12. IEEE, 2019.

(*Outstanding Paper Award)*
Chan, David M., Roshan Rao, Forrest Huang, and John F. Canny. "t-SNE-CUDA: GPU-Accelerated t-SNE and its Applications to Modern Data." In 2018 30th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD), pp. 330-338. IEEE, 2018.

Cohen, Liron, Glenn Wagner, **David Chan,** Howie Choset, Nathan Sturtevant, Sven Koenig, and TK Satish Kumar. "Rapid randomized restarts for multi-agent path finding solvers." In Eleventh Annual Symposium on Combinatorial Search. 2018.

Walker, Thayne T., **David M. Chan,** and Nathan R. Sturtevant. "Using hierarchical constraints to avoid conflicts in multi-agent pathfinding." In Twenty-Seventh International Conference on Automated Planning and Scheduling. 2017.

Mollahosseini, Ali, **David Chan**, and Mohammad H. Mahoor. "Going deeper in facial expression recognition using deep neural networks." In 2016 IEEE Winter conference on applications of computer vision (WACV), pp. 1-10. IEEE, 2016.

Mollahosseini, Ali, Behzad Hasani, Michelle J. Salvador, Hojjat Abdollahi, **David Chan**, and Mohammad H. Mahoor. "Facial expression recognition from world wild web." In Proceedings of the IEEE conference on computer vision and pattern recognition workshops, pp. 58-65. 2016.

Journal Publications

Figueroa, Caroline A., Tiffany C. Luo, Andrea Jacobo, Alan Munoz, Minx Manuel, **David Chan,** John Canny, and Adrian Aguilera. "Conversational physical activity coaches for spanish and english speaking women: a user design study." Frontiers in digital health 3 (2021).

Chan, David M., Roshan Rao, Forrest Huang, and John F. Canny. "GPU accelerated t-distributed stochastic neighbor embedding." Journal of Parallel and Distributed Computing 131 (2019): 1-13.

Technical Reports

Jhamb, Dhruv, **David Chan**, John F. Canny, and Avideh Zakhor. "Hallucination Is All You Need: Using Generative Models for Test Time Data Augmentation." (Supervised Master's Thesis at UCB, 2022)

Herzi, Ilian**, David Chan**, and John F. Canny. "Exploring the Effects of View Transforms on Self-Supervised Video Representation Learning Techniques." (Supervised Master's Thesis at UCB, 2021).

Preprints (and under review)

Kosoy, Eliza*, **David M. Chan***, Adrian Liu, Jasmine Collins, Bryanna Kaufmann, Sandy Han Huang, Jessica B. Hamrick, John Canny, Nan Rosemary Ke, and Alison Gopnik. "Towards Understanding How Machines Can Learn Causal Overhypotheses." arXiv preprint arXiv:2206.08353 (2022).

Wang, Kehan, **David Chan,** Seth Z. Zhao, John Canny, and Avideh Zakhor. "Misinformation Detection in Social Media Video Posts." arXiv preprint arXiv:2202.07706 (2022).

Jiwani, Aatif, Shubhrakanti Ganguly, Chao Ding, Nan Zhou, and **David M. Chan**. "A semantic segmentation network for urban-scale building footprint extraction using rgb satellite imagery." arXiv preprint arXiv:2104.01263 (2021).

Negi, Pooran Singh, **David M. Chan**, and Mohammad Mahoor. "Leveraging Class Similarity to Improve Deep Neural Network Robustness." arXiv preprint arXiv:1812.09744 (2018).

Jiang, Biye, **David M. Chan,** Tianhao Zhang, and John F. Canny. "Diagnostic Visualization for Deep Neural Networks Using Stochastic Gradient Langevin Dynamics." arXiv preprint arXiv:1812.04604 (2018).

TEACHING EXPERIENCE

University of California, Berkeley

CS182, Designing, Visualizing and Understanding Deep Neural Networks Spring 2020
(Lead) Teaching Assistant

CS182, Designing, Visualizing and Understanding Deep Neural Networks — Spring 2019
Teaching Assistant

University of Denver

COMP 3004, Foundations in Discrete Structures and Algorithms — Summer 2017
Co-Instructor

COMP 3004, Foundations in Discrete Structures and Algorithms — Spring 2017
(Lead) Teaching Assistant — Fall 2017

COMP 3003, Foundations in Computer Systems — Spring 2017
Teaching Assistant — Spring 2016

COMP 3004, Foundations in Discrete Structures and Algorithms — Spring 2016
Teaching Assistant — Fall 2016
Spring 2015

COMP 3004, Foundations in Discrete Structures and Algorithms — Spring 2016
Teaching Assistant — Fall 2016
Spring 2015

GRANTS AND FUNDING

Google BAIR Commons Funded Project — 2020-2023
"Assistive Video Description" $450K, Student Co-PI

Amazon BAIR Commons Funded Project — 2021-2022
"Weakly Supervised Multi-modal pre-training" $150K, Student Co-PI

UC Berkeley CTSP Fellowship — 2020
"Conversational Coaches for Diverse Individuals with Low Literacy" $5K

CITRIS Institute Tech Innovation Grant — 2020
"Conversational Coaches for Diverse Individuals with Low Literacy" $10K

University of Denver Undergraduate Research Grant — 2015
"Deep Neural Networks for Facial Expression Recognition" $3K

University of Denver PINS (Parners in Scholarship Grant) — 2016
"Bayesian Priors for Object Recognition" $1.5K

HONORS AND AWARDS

Herbert J Greenburg Award for Excellence in Mathematics — 2017
DU Computer Science Departmental Service Award (Inaugural Recipient) — 2017
Undergraduate Student Researcher of the Year — 2017
Outstanding Computer Science Major — 2016,2017
Outstanding Mathematics Major — 2015,2016,2017

SELECTED PRESENTATIONS AND INVITED LECTURES

Pytorch Lightning Developer's Conference	2022
CVPR 2022 (Workshop), "What's in a Caption"	2022
Google, "What's in a Caption"	2022
Amazon, "Multimodal Automated Speech Recognition"	2022
ICASSP 2022 Oral, "Multimodal Automated Speech Recognition"	2022
Google, "Vision and Language Pre-Training for Visual Description"	2021
BAIR Workshop 2021, "Multimodal Automated Speech Recognition"	2021
BAIR Workshop 2021, "Visual Description"	2021
Google, "Active Learning for Visual Description"	2020
ACCV 2020, "Active Learning for Visual Description"	2020
BAIR Workshop 2020, "Active Learning for Visual Description"	2020

PROFESSIONAL AFFILIATIONS

IEEE Student Member, 2016-Present
ACM Student Member, 2015-Present
SIGAI, SIGHCI Interest Group Member

PROFESSIONAL AND COMMUNITY SERVICE

Peer-Reviewed Articles for: WACV, NeurIPS, ICLR, ICCV, ECCV, ACCV, CVPR, HPML, JPDC, AMLC, BMVC, MMSJ, IEEE-Aerospace

UC Berkeley Incoming Grad Student Peer Mentor	2021-Present
UC Berkeley BAIR Webmaster	2021-Present
UC Berkeley EECS Graduate Admissions Committee	2020, 2021