Stanford



Nicholas Haber

Assistant Professor of Education

Graduate School of Education

Curriculum Vitae available Online

CONTACT INFORMATION

- **Admin. Support**

  Mitch Gilmer

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Bio

BIO

Nick Haber is an Assistant Professor at the Stanford Graduate School of Education, and by courtesy, Computer Science. After receiving his PhD in mathematics on Partial Differential Equation theory, he worked on Sension, a company that applied computer vision to online education. He then co-founded the Autism Glass Project at Stanford, a research effort that employs wearable technology and computer vision in a tool for children with autism. Aside from such work on learning and therapeutic tools, he and his research group develop artificial intelligence systems meant to mimic and model the ways people learn early in life, exploring their environments through play, social interaction, and curiosity.

ACADEMIC APPOINTMENTS

- Assistant Professor, Graduate School of Education
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Postdoctoral Fellow, Stanford University, (2014-2019)
- Postdoctoral Fellow, McGill University, (2014-2014)
- Postdoctoral Fellow, Mathematical Sciences Research Institute, (2013-2013)
- Graduate Student, Stanford University, (2009-2013)
- Undergraduate Research, Brown University, (2007-2008)
- Undergraduate Research, Brown University, (2006-2007)
- NSF Mathematics REU, Lafayette College, (2005-2005)

HONORS AND AWARDS

- Walter V. and Idun Berry Postdoctoral Fellow, Stanford University (2015)
- Magna Cum Laude, Brown University (2008)
- Member, Phi Beta Kappa (2006)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Chief Scientific Officer, Sension, Inc (2013 - present)

PROGRAM AFFILIATIONS

- Symbolic Systems Program

PROFESSIONAL EDUCATION

- Sc.B., Brown University , Mathematics & Economics (2008)
- Ph.D., Stanford University , Mathematics (2013)

PATENTS

- Nicholas Haber, Catalin Voss. "United States Patent Application 14/275851 Systems and methods for detection of behavior correlated with outside distractions in examinations"
- Nicholas Haber, Catalin Voss. "United States Patent Application 61/821,921 System and Method for Analysis of Visual Viewer Reactions to Video Content. US Application"

LINKS

- Autonomous Agents Lab site: https://autonomousagents.stanford.edu

Research & Scholarship

RESEARCH INTERESTS

- Artificial intelligence (AI)
- Child and Adolescent Development
- Cognitive Development
- Collaborative Learning
- Data Science
- Human-Computer Interaction
- Learning Sciences
- Quantitative Methods
- Social-Emotional Learning

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I use AI models of of exploratory and social learning in order to better understand early human learning and development, and conversely, I use our understanding of early human learning to make robust AI models that learn in exploratory and social ways. Based on this, I develop AI-powered learning tools for children, geared in particular towards the education of those with developmental issues such as the Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder, in the mold of my work on the Autism Glass Project. My formal graduate training in pure mathematics involved extending partial differential equation theory in cases involving the propagation of waves through complex media such as the space around a black hole. Since then, I have transitioned to the use of machine learning in developing both learning tools for children with developmental disorders and AI and cognitive models of learning.

Teaching

COURSES

2026-27

- Computer Vision for Education and Social Science Research: CS 432, EDUC 463 (Win)
- Curiosity in Artificial Intelligence: EDUC 234, PSYCH 240A (Spr)
- Interactive and Embodied Learning: CS 422, EDUC 234A (Win)
- Learning Sciences and Technology Design Research Seminar and Colloquium: EDUC 291 (Aut)

2025-26

- Curiosity in Artificial Intelligence: EDUC 234, PSYCH 240A (Spr)
- Interactive and Embodied Learning: CS 422, EDUC 234A (Win)
- Learning Sciences and Technology Design Research Seminar and Colloquium: EDUC 291 (Spr)

2023-24

- Computer Vision for Education and Social Science Research: CS 432, EDUC 463 (Win)
- Curiosity in Artificial Intelligence: EDUC 234, PSYCH 240A (Spr)
- Education Data Science Seminar: EDUC 259A (Aut)
- Education Data Science Seminar: EDUC 259B (Win)
- Education Data Science Seminar: EDUC 259C (Spr)
- Interactive and Embodied Learning: CS 422, EDUC 234A (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Hansol Lee

Doctoral Dissertation Advisor (AC)

Merve Cerit, Xi Jia Zhou

Doctoral Dissertation Co-Advisor (AC)

Michael Bereket, Bethanie Drake-Maples, Julio Martinez, Sang Truong

Master's Program Advisor

Max Meyberg

Doctoral (Program)

Merve Cerit, Bethanie Drake-Maples, Tianyu Hua, Emily Jin, Konwoo Kim, Jared Moore, Xi Jia Zhou

Publications

PUBLICATIONS

- **Stanford Screenomics: An Open-source Platform for Unobtrusive Multimodal Digital Trace Data Collection from Android Smartphones.** *medRxiv : the preprint server for health sciences*
  Kim, I., Boffa, J., Cho, M., Conroy, D. E., Kline, N., Haber, N., Robinson, T. N., Reeves, B., Ram, N.
  2025

- **Expressing stigma and inappropriate responses prevents LLMs from safely replacing mental health providers.**
  Moore, J., Grabb, D., Agnew, W., Klyman, K., Chancellor, S., Ong, D. C., Haber, N., ACM
  ASSOC COMPUTING MACHINERY.2025: 599-627

- **Symmetrical Visual Contrastive Optimization: Aligning Vision-Language Models with Minimal Contrastive Images**
  Wu, S., Sun, F., Wen, K., Haber, N.
  edited by Che, W., Nabende, J., Shutova, E., Pilehvar, M. T.
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2025: 30284-30297

- **Scaffold or Crutch? Examining College Students' Use and Views of Generative AI Tools for STEM Education**
  Wang, K. D., Wu, Z., Tufts, L., Wieman, C., Salehi, S., Haber, N., IEEE
  IEEE.2025

- **Media Content Atlas: A Pipeline to Explore and Investigate Multidimensional Media Space using Multimodal LLMs**
  Cerit, M., Zelikman, E., Cho, M., Robinson, T. N., Reeves, B., Ram, N., Haber, N., ACM
  ASSOC COMPUTING MACHINERY.2025

- **Person-Specific Analyses of Smartphone Use and Mental Health: An Intensive Longitudinal Study Over One Year.** *JMIR formative research*
  Cerit, M., Lee, A. Y., Hancock, J., Miner, A., Cho, M. J., Muise, D., Garròn Torres, A. A., Haber, N., Ram, N., Robinson, T., Reeves, B.
  2024

- **Examining the potential and pitfalls of ChatGPT in science and engineering problem-solving** *FRONTIERS IN EDUCATION*
  Wang, K. D., Burkholder, E., Wieman, C., Salehi, S., Haber, N.
  2024; 8

- **Discovering Players' Problem-Solving Behavioral Characteristics in a Puzzle Game through Sequence Mining**
  Wang, K. D., Liu, H., DeLiema, D., Haber, N., Salehi, S., Assoc Computing Machinery
  ASSOC COMPUTING MACHINERY.2024: 498-506

- **HOLODECK: Language Guided Generation of 3D Embodied AI Environments**
  Yang, Y., Sun, F., Weihs, L., Vanderbilt, E., Herrasti, A., Han, W., Wu, J., Haber, N., Krishna, R., Liu, L., Callison-Burch, C., Yatskar, M., Kembhavi, et al
  IEEE COMPUTER SOC.2024: 16227-16237

- **Partial-View Object View Synthesis via Filtering Inversion**
  Sun, F., Tremblay, J., Blukis, V., Lin, K., Xu, D., Ivanovic, B., Karkus, P., Birchfield, S., Fox, D., Zhang, R., Li, Y., Wu, J., Pavone, et al
  IEEE COMPUTER SOC.2024: 453-463

- **Binding the Person-Specific Approach to Modern AI in the Human Screenome Project: Moving past Generalizability to Transferability.** *Multivariate behavioral research*
  Ram, N., Haber, N., Robinson, T. N., Reeves, B.
  2023: 1-9

- **Parsel(sic) : Algorithmic Reasoning with Language Models by Composing Decompositions**
  Zelikman, E., Huang, Q., Poesia, G., Goodman, N. D., Haber, N.
  edited by Oh, A., Neumann, T., Globerson, A., Saenko, K., Hardt, M., Levine, S.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2023

- **Communication Skills Training Using Remote Augmented Reality Medical Simulation: a Feasibility and Acceptability Qualitative Study.** *Medical science educator*
  Hess, O., Qian, J., Bruce, J., Wang, E., Rodriguez, S., Haber, N., Caruso, T. J.
  2022: 1-10

- **Improved Digital Therapy for Developmental Pediatrics Using Domain-Specific Artificial Intelligence: Machine Learning Study.** *JMIR pediatrics and parenting*
  Washington, P., Kalantarian, H., Kent, J., Husic, A., Kline, A., Leblanc, E., Hou, C., Mutlu, O. C., Dunlap, K., Penev, Y., Varma, M., Stockham, N. T., Chrisman, et al
  2022; 5 (2): e26760

- **Training Affective Computer Vision Models by Crowdsourcing Soft-Target Labels** *COGNITIVE COMPUTATION*
  Washington, P., Kalantarian, H., Kent, J., Husic, A., Kline, A., Leblanc, E., Hou, C., Mutlu, C., Dunlap, K., Penev, Y., Stockham, N., Chrisman, B., Paskov, et al
  2021

- **Training Affective Computer Vision Models by Crowdsourcing Soft-Target Labels.** *Cognitive computation*
  Washington, P., Kalantarian, H., Kent, J., Husic, A., Kline, A., Leblanc, E., Hou, C., Mutlu, C., Dunlap, K., Penev, Y., Stockham, N., Chrisman, B., Paskov, et al
  2021; 13 (5): 1363-1373

- **Integrated eye tracking on Magic Leap One during augmented reality medical simulation: a technical report** *BMJ SIMULATION & TECHNOLOGY ENHANCED LEARNING*
  Caruso, T. J., Hess, O., Roy, K., Wang, E., Rodriguez, S., Palivathukal, C., Haber, N.
  2021; 7 (5): 431-434

- **Crowdsourced privacy-preserved feature tagging of short home videos for machine learning ASD detection.** *Scientific reports*
  Washington, P., Tariq, Q., Leblanc, E., Chrisman, B., Dunlap, K., Kline, A., Kalantarian, H., Penev, Y., Paskov, K., Voss, C., Stockham, N., Varma, M., Husic, et al
  2021; 11 (1): 7620

- **Integrated eye tracking on Magic Leap One during augmented reality medical simulation: a technical report.** *BMJ simulation & technology enhanced learning*
  Caruso, T. J., Hess, O., Roy, K., Wang, E., Rodriguez, S., Palivathukal, C., Haber, N.
  2021; 7 (5): 431-434

- **Selection of trustworthy crowd workers for telemedical diagnosis of pediatric autism spectrum disorder.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Washington, P., Leblanc, E., Dunlap, K., Penev, Y., Varma, M., Jung, J., Chrisman, B., Sun, M. W., Stockham, N., Paskov, K. M., Kalantarian, H., Voss, C., Haber, et al
  2021; 26: 14–25

- **Selection of trustworthy crowd workers for telemedical diagnosis of pediatric autism spectrum disorder**
  Washington, P., Leblanc, E., Dunlap, K., Penev, Y., Varma, M., Jung, J., Chrisman, B., Sun, M., Stockham, N., Paskov, K., Kalantarian, H., Voss, C., Haber, et al
  edited by Altman, R. B., Dunker, A. K., Hunter, L., Ritchie, M. D., Murray, T., Klein, T. E.
  WORLD SCIENTIFIC PUBL CO PTE LTD.2021: 14-25

- **Precision Telemedicine through Crowdsourced Machine Learning: Testing Variability of Crowd Workers for Video-Based Autism Feature Recognition.** *Journal of personalized medicine*
  Washington, P., Leblanc, E., Dunlap, K., Penev, Y., Kline, A., Paskov, K., Sun, M. W., Chrisman, B., Stockham, N., Varma, M., Voss, C., Haber, N., Wall, et al
  2020; 10 (3)

- **Toward Continuous Social Phenotyping: Analyzing Gaze Patterns in an Emotion Recognition Task for Children With Autism Through Wearable Smart Glasses.** *Journal of medical Internet research*
  Nag, A., Haber, N., Voss, C., Tamura, S., Daniels, J., Ma, J., Chiang, B., Ramachandran, S., Schwartz, J., Winograd, T., Feinstein, C., Wall, D. P.
  2020; 22 (4): e13810

- **Feature Selection and Dimension Reduction of Social Autism Data.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Washington, P. n., Paskov, K. M., Kalantarian, H. n., Stockham, N. n., Voss, C. n., Kline, A. n., Patnaik, R. n., Chrisman, B. n., Varma, M. n., Tariq, Q. n., Dunlap, K. n., Schwartz, J. n., Haber, et al
  2020; 25: 707–18

- **Active World Model Learning with Progress Curiosity**
  Kim, K., Sano, M., De Freitas, J., Haber, N., Yamins, D.
  edited by Daume, H., Singh, A.
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2020

- **Feature Selection and Dimension Reduction of Social Autism Data**
  Washington, P., Paskov, K., Kalantarian, H., Stockham, N., Voss, C., Kline, A., Patnaik, R., Chrisman, B., Varma, M., Tariq, Q., Dunlap, K., Schwartz, J., Haber, et al
  edited by Altman, R. B., Dunker, A. K., Hunter, L., Ritchie, M. D., Murray, T., Klein, T. E.
  WORLD SCIENTIFIC PUBL CO PTE LTD.2020: 707-718

- **Data-Driven Diagnostics and the Potential of Mobile Artificial Intelligence for Digital Therapeutic Phenotyping in Computational Psychiatry.** *Biological psychiatry. Cognitive neuroscience and neuroimaging*
  Washington, P., Park, N., Srivastava, P., Voss, C., Kline, A., Varma, M., Tariq, Q., Kalantarian, H., Schwartz, J., Patnaik, R., Chrisman, B., Stockham, N., Paskov, et al
  2019

- **SUPERPOWER GLASS** *MOBILE COMPUTING AND COMMUNICATIONS REVIEW*

Kline, A., Voss, C., Washington, P., Haber, N., Schwartz, J., Tariq, Q., Winograd, T., Feinstein, C., Wall, D. P.
2019; 23 (2): 35–38

- **Validity of Online Screening for Autism: Crowdsourcing Study Comparing Paid and Unpaid Diagnostic Tasks.** *Journal of medical Internet research*
  Washington, P., Kalantarian, H., Tariq, Q., Schwartz, J., Dunlap, K., Chrisman, B., Varma, M., Ning, M., Kline, A., Stockham, N., Paskov, K., Voss, C., Haber, et al
  2019; 21 (5): e13668

- **Effect of Wearable Digital Intervention for Improving Socialization in Children With Autism Spectrum Disorder A Randomized Clinical Trial** *JAMA PEDIATRICS*
  Voss, C., Schwartz, J., Daniels, J., Kline, A., Haber, N., Washington, P., Tariq, Q., Robinson, T. N., Desai, M., Phillips, J. M., Feinstein, C., Winograd, T., Wall, et al
  2019; 173 (5): 446–54

- **Effect of Wearable Digital Intervention for Improving Socialization in Children With Autism Spectrum Disorder: A Randomized Clinical Trial.** *JAMA pediatrics*
  Voss, C., Schwartz, J., Daniels, J., Kline, A., Haber, N., Washington, P., Tariq, Q., Robinson, T. N., Desai, M., Phillips, J. M., Feinstein, C., Winograd, T., Wall, et al
  2019

- **Addendum to the Acknowledgements: Validity of Online Screening for Autism: Crowdsourcing Study Comparing Paid and Unpaid Diagnostic Tasks.** *Journal of medical Internet research*
  Washington, P. n., Kalantarian, H. n., Tariq, Q. n., Schwartz, J. n., Dunlap, K. n., Chrisman, B. n., Varma, M. n., Ning, M. n., Kline, A. n., Stockham, N. n., Paskov, K. n., Voss, C. n., Haber, et al
  2019; 21 (6): e14950

- **The Potential for Machine Learning-Based Wearables to Improve Socialization in Teenagers and Adults With Autism Spectrum Disorder-Reply.** *JAMA pediatrics*
  Voss, C. n., Haber, N. n., Wall, D. P.
  2019

- **Guess What?: Towards Understanding Autism from Structured Video Using Facial Affect.** *Journal of healthcare informatics research*
  Kalantarian, H., Washington, P., Schwartz, J., Daniels, J., Haber, N., Wall, D. P.
  2019; 3: 43–66

- **Exploratory study examining the at-home feasibility of a wearable tool for social-affective learning in children with autism** *NPJ DIGITAL MEDICINE*
  Daniels, J., Schwartz, J. N., Voss, C., Haber, N., Fazel, A., Kline, A., Washington, P., Feinstein, C., Winograd, T., Wall, D. P.
  2018; 1

- **Exploratory study examining the at-home feasibility of a wearable tool for social-affective learning in children with autism.** *NPJ digital medicine*
  Daniels, J., Schwartz, J. N., Voss, C., Haber, N., Fazel, A., Kline, A., Washington, P., Feinstein, C., Winograd, T., Wall, D. P.
  2018; 1: 32

- **Feasibility Testing of a Wearable Behavioral Aid for Social Learning in Children with Autism** *APPLIED CLINICAL INFORMATICS*
  Daniels, J., Haber, N., Voss, C., Schwartz, J., Tamura, S., Fazel, A., Kline, A., Washington, P., Phillips, J., Winograd, T., Feinstein, C., Wall, D. P.
  2018; 9 (1): 129–40

- **Learning to Play With Intrinsically-Motivated, Self-Aware Agents**
  Haber, N., Mrowca, D., Wang, S., Li Fei-Fei, Yamins, D. L. K.
  edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018

- **Flexible Neural Representation for Physics Prediction**
  Mrowca, D., Zhuang, C., Wang, E., Haber, N., Li Fei-Fei, Tenenbaum, J. B., Yamins, D. L. K.
  edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018

- **Sparsifying machine learning models identify stable subsets of predictive features for behavioral detection of autism** *MOLECULAR AUTISM*

Levy, S., Duda, M., Haber, N., Wall, D. P.
2017; 8: 65

- **Crowdsourced validation of a machine-learning classification system for autism and ADHD.** *Translational psychiatry*
  Duda, M., Haber, N., Daniels, J., Wall, D. P.
  2017; 7 (5)
- **The Feynman Propagator on Perturbations of Minkowski Space** *COMMUNICATIONS IN MATHEMATICAL PHYSICS*
  Gell-Redman, J., Haber, N., Vasy, A.
  2016; 342 (1): 333-384
- **Use of machine learning for behavioral distinction of autism and ADHD.** *Translational psychiatry*
  Duda, M., Ma, R., Haber, N., Wall, D. P.
  2016; 6
- **A Practical Approach to Real-Time Neutral Feature Subtraction for Facial Expression Recognition**
  Haber, N., Voss, C., Fazel, A., Winograd, T., Wall, D. P., IEEE
  IEEE.2016
- **Propagation of singularities around a Lagrangian submanifold of radial points** *Bulletin de la SMF*
  Haber, N., Vasy, A.
  2015
- **PROPAGATION OF SINGULARITIES AROUND A LAGRANGIAN SUBMANIFOLD OF RADIAL POINTS** *BULLETIN DE LA SOCIETE MATHEMATIQUE DE FRANCE*
  Haber, N., Vasy, A.
  2015; 143 (4): 679-726
- **A Normal Form Around a Lagrangian Submanifold of Radial Points** *INTERNATIONAL MATHEMATICS RESEARCH NOTICES*
  Haber, N.
  2014: 4804-4821
- **The Feynman propagator on perturbations of minkowski space.** *arXiv.org*
  Gell-Redman, J., Haber, N., Vasy, A.
  2014
- **Microlocal analysis of Lagrangian submanifolds of radial points** *Stanford University Thesis*
  Haber, N.
  2013
- **Color-Permuting Automorphisms of Cayley Graphs** *Congressus Numerantium*
  Albert, M., Bratz, J., Cahn, P., Fargus, T., Haber, N., McMahon, E., Smith, J., Tekansik, S.
  2008; 190: 161-177