DANIEL HAEHN

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I am a biomedical imaging and visualization researcher who investigates how the study of brain connectivity and machine perception can help advance the understanding of biologically inspired artificial intelligence.

Education

2019 — **PhD in Computer Science, Harvard University** — Cambridge, MA
Analyzing Brain Connectivity and Computing Machine Perception
Advisor: Hanspeter Pfister
Committee: Steven Gortler, Finale Doshi-Velez, Scott Kuindersma, Jeff W. Lichtman

2010 — **Diplom (MSc) in Medical Computer Science, University of Heidelberg** — Germany
Signal- and Image Processing
Thesis: Coronary Artery Centerline Extraction
Advisors: Hartmut Dickhaus, Ron Kikinis

2007 — **Vordiplom (BSc) in Medical Computer Science, University of Heidelberg** — Germany
with Honors, rank #1 of class, all study fees waived

Experience

2019–present — **University of Massachusetts Boston** — Boston, MA
Assistant Professor of Computer Science (Tenure-track)
Director of the Machine Psychology research group
Associate of the Harvard John A. Paulson School of Engineering and Applied Sciences

Summer 2017 — **Apple, Inc.** — Cupertino, CA
Research Intern in Data Science

Summer 2014 — **Mental Canvas** — New York City, NY
Research Intern in Computer Graphics

2011–2013 — **Boston Children's Hospital** — Boston, MA
Research Software Developer III, Fetal Neonatal Neuroimaging and Developmental Science Center
Advisors: Rudolph Pienaar, P. Ellen Grant

2010–2011 — **University of Pennsylvania** — Philadelphia, PA
Research Scholar, Section for Biomedical Image Analysis
Advisor: Kilian Pohl

Experience (continued)

2009 **German Cancer Research Center (DKFZ) and BioQuant Center** Heidelberg, Germany
Research Assistant, Biomedical Computer Vision and Experimental Radiology Research Groups
Advisors: Stefan Wörz, Hendrik von Tengg-Kobligk

2008–2009 **Brigham and Women's Hospital** Boston, MA
Fellow, Department of Radiology and the Surgical Planning Laboratory
Advisors: Ron Kikinis, Steve Pieper, Luca Antiga

Publications

2021 Bella Baidak, Yahiya Hussain, Emma Kelminson, Thouis R. Jones, Loraine Franke, and Daniel Haehn. **CellProfiler Analyst Web (CPAW) - Exploration, analysis, and classification of biological images on the web.** *IEEE Visualization Short Paper (IEEE VIS).*

2021 Loraine Franke, Daniel Karl I Weidele, Fan Zhang, Suheyla Cetin-Karayumak, Steve Pieper, Lauren J O'Donnell, Yogesh Rathi, and Daniel Haehn. **FiberStars: Visual Comparison of Diffusion Tractography Data between Multiple Subjects.** *IEEE Pacific Visualization (PacificVis).*

2020 Daniel Haehn, Loraine Franke, Fan Zhang, Suheyla Cetin Karayumak, Steve Pieper, Lauren O'Donnell, and Yogesh Rathi. **TRAKO: Efficient Transmission of Tractography Data for Visualization**. *Medical Image Computing and Computer-Assisted Intervention (MICCAI).*

2020 Vincent Casser, Kai Kang, Hanspeter Pfister, and Daniel Haehn. **Fast Mitochondria Detection for Connectomics**. *International Conference on Medical Imaging with Deep Learning (Spotlight Award at MIDL).*

2020 Zudi Lin, Donglai Wei, Won-Dong Jang, Siyan Zhou, Xupeng Chen, Xueying Wang, Richard L. Schalek, Daniel R. Berger, Brian Matejek, Lee D. Kamentsky, Adi Peleg, Daniel Haehn, Thouis R. Jones, Toufiq Parag, Jeff W. Lichtman, and Hanspeter Pfister. **Two-Stream Active Query Suggestion for Large-Scale Object Detection in Connectomics**. *European Conference on Computer Vision (ECCV).*

2020 Fritz Lekschas, Brant Peterson, Daniel Haehn, Eric Ma, Nils Gehlenborg, and Hanspeter Pfister. **Peax: Interactive Visual Pattern Search in Sequential Data Using Unsupervised Deep Representation Learning.** *Computer Graphics Forum (Best Paper Award at EuroVis).*

2019 Brian Matejek, Daniel Haehn, Haidong Zhu, Donglai Wei, Toufiq Parag, and Hanspeter Pfister. **Biologically-Constrained Graphs for Global Connectomics Reconstruction**. *IEEE Computer Vision and Pattern Recognition (CVPR).*

2018 Daniel Haehn, James Tompkin, and Hanspeter Pfister. **Evaluating 'Graphical Perception' with CNNs.** *IEEE Transactions on Visualization and Computer Graphics (IEEE VIS).*

2018 Daniel Haehn, Verena Kaynig, James Tompkin, Jeff W. Lichtman, and Hanspeter Pfister. **Guided Proofreading of Automatic Segmentations for Connectomics**. *IEEE Computer Vision and Pattern Recognition (CVPR).*

Publications (continued)

2017 Daniel Haehn, John Hoffer, Brian Matejek, Adi Suissa-Peleg, Ali K. Al-Awami, Lee Kamentsky, Felix Gonda, Eagon Meng, William Zhang, Richard Schalek, Alyssa Wilson, Toufiq Parag, Johanna Beyer, Verena Kaynig, Thouis R. Jones, James Tompkin, Markus Hadwiger, Jeff W. Lichtman, and Hanspeter Pfister. **Scalable Interactive Visualization for Connectomics.** *MDPI Informatics*.

2017 Brian Matejek, Daniel Haehn, Fritz Lekschas, Michael Mitzenmacher, and Hanspeter Pfister. **Compresso: Efficient Compression of Segmentation Data For Connectomics**. *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*.

2017 Felix Gonda, Verena Kaynig, Thouis R. Jones, Daniel Haehn, Jeff W. Lichtman, Toufiq Parag, and Hanspeter Pfister. **ICON: An Interactive Approach to train Deep Neural Networks for Segmentation of Neuronal Structures**. *IEEE International Symposium on Biomedical Imaging (ISBI)*.

2017 Rudolph Pienaar, Ata Turk, Jorge Bernal-Rusiel, Nicolas Rannou, Daniel Haehn, P. Ellen Grant, and Orran Krieger. **CHIPS--A Service for Collecting, Organizing, Processing, and Sharing Medical Image Data in the Cloud**. *VLDB Workshop on Data Management and Analytics for Medicine and Healthcare*.

2016 Adi Suissa-Peleg, Daniel Haehn, Seymour Knowles-Barley, Verena Kaynig, Thouis R. Jones, Alyssa Wilson, Richard Schalek, Jeff W. Lichtman, and Hanspeter Pfister. **Automatic Neural Reconstruction from Petavoxel of Electron Microscopy Data.** *Microscopy and Microanalysis*.

2016 Ali K. Al-Awami, Johanna Beyer, Daniel Haehn, Narayanan Kasthuri, Jeff W. Lichtman, Hanspeter Pfister, and Markus Hadwiger. **NeuroBlocks--Visual Tracking of Segmentation and Proofreading for Large Connectomics Projects.** *IEEE Transactions on Visualization and Computer Graphics (IEEE VIS)*.

2016 Richard Schalek, Dong Lee, Narayanan Kasthuri, Adi Peleg, Thouis R. Jones, Verena Kaynig, Daniel Haehn, Hanspeter Pfister, David Cox, and Jeff W. Lichtman. **Imaging a 1 mm^3 Volume of Rat Cortex using a MultiBeam SEM.** *Microscopy and Microanalysis*.

2015 Kiho Im, Banu Ahtam, Daniel Haehn, Jurriaan M. Peters, Simon K. Warfield, Mustafa Sahin, and P. Ellen Grant. **Altered Structural Brain Networks in Tuberous Sclerosis Complex.** *Cerebral Cortex*.

2015 Rudolph Pienaar, Nicolas Rannou, Jorge Bernal, Daniel Haehn, and P. Ellen Grant. **ChRIS--A web-based Neuroimaging and Informatics System for Collecting, Organizing, Processing, Visualizing and Sharing of Medical Data**. *IEEE Engineering in Medicine and Biology Society (EMBC)*.

2014 Daniel Haehn, Seymour Knowles-Barley, Mike Roberts, Johanna Beyer, Narayanan Kasthuri, Jeff W. Lichtman, and Hanspeter Pfister. **Design and Evaluation of Interactive Proofreading Tools for Connectomics.** *IEEE Transactions on Visualization and Computer Graphics (IEEE VIS)*.

2013 Daniel Haehn, Nicolas Rannou, P. Ellen Grant, and Rudolph Pienaar. **Slice:Drop -- Collaborative Medical Imaging in the Browser**. *ACM SIGGRAPH Computer Animation Festival*.

2012 Daniel Haehn, Nicolas Rannou, Banu Ahtam, P. Ellen Grant, and Rudolph Pienaar. **Neuroimaging in the Browser using the X Toolkit.** *Frontiers in Neuroinformatics (Spotlight Award at INCF Neuroinformatics)*.

Publications (continued)

2012 Myong-sun Choe, Silvia Ortiz-Mantilla, Nikos Makris, Matt Gregas, Janine Bacic, Daniel Haehn, David Kennedy, Rudolph Pienaar, Verne S. Caviness Jr, April A. Benasich, and P. Ellen Grant. **Regional Infant Brain Development: an MRI-based Morphometric Analysis in 3 to 13 month olds.** *Cerebral Cortex*.

2012 Arno Klein, Forrest S. Bao, Yrjö Häme, Eliezer Stavsky, Joachim Giard, Daniel Haehn, Nolan Nichols, and Satrajit S. Ghosh. **Mindboggle: Automated Human Brain MRI Feature Extraction, Labeling, Morphometry, and Online Visualization.** *Frontiers in Neuroinformatics*.

2012 Arno Klein, Nolan Nichols, and Daniel Haehn. **Mindboggle 2 interface: Online Visualization of Extracted Brain Features with XTK.** *Frontiers in Neuroinformatics*.

Mentoring

2021–present Neha Goyal, Graduate student (MSc) at the University of Massachusetts Boston
2021–present Anh Vo, Graduate student (PhD) at the University of Massachusetts Boston
2021 Hayoun Oh, Graduate student (PhD) at Harvard University
2020–present Jiali Cheng, Graduate researcher (MSc) at Northeastern University
2020–present Kristin (Yanan) Qi, Graduate student (PhD) at the University of Massachusetts Boston
2020–present Aswin Vasudevan, Graduate student (PhD) at the University of Massachusetts Boston
2020 Gianna Yang, Graduate student (Msc) at the University of Massachusetts Boston
2020 Barkha Java, Graduate student (MSc) at the University of Massachusetts Boston
2019–present Loraine Franke, Graduate student (PhD) at the University of Massachusetts Boston
2019–2021 Jesse Freeman, Graduate student (PhD) at the University of Massachusetts Boston
2019–2021 Yahiya Hussain, Undergraduate student at the University of Massachusetts Boston
2019–2021 Nandinii Yeleswarapu, Undergraduate student at the University of Massachusetts Boston
2019–2020 Safwa Ali, Undergraduate student at the University of Massachusetts Boston
2019–2020 Huda Irshad, Undergraduate student at the University of Massachusetts Boston
2019 Manish Mourya, Research assistant at the University of Massachusetts Boston
2018–2020 Vincent Casser, Graduate student (MSc) at Harvard University
2018–2020 Ian Svetkey, Intern at Harvard University
2016 Eagon Meng, Undergraduate student at Harvard University
2016 Omar Shaikh, (Remote-) Intern at Harvard University
2015–2017 John Hoffer, Undergraduate student at Harvard University
2015 William Zhang, Intern at Harvard University
2013 Jay Andrew Robinson, Intern at Boston Children's Hospital (co-mentored)
2013 Emily Seibring, Intern at Boston Children's Hospital (co-mentored)
2010-2011 Suares Tamekue, Intern at Brigham and Women's Hospital (co-mentored)

Teaching

2021	**Instructor for the CS480 Special Topics: Biomedical Signal and Image Processing course at the University of Massachusetts Boston (Instructor rating: 4.8/5, Course rating: 4.75/5)**
2021	**Instructor for the CS410 Software Engineering course at the University of Massachusetts Boston (Instructor rating: 4.59/5, Course rating: 4.45/5)**
2021	Guest Lecturer for CSCI2254 Web Application Development at Boston College
2020	**Instructor for the CS460 Computer Graphics course at the University of Massachusetts Boston (Instructor rating: 4.9/5, Course rating: 4.9/5)**
2020	**Instructor for the CS410 Software Engineering course at the University of Massachusetts Boston (new curriculum, Instructor rating: 4.87/5, Course rating: 4.73/5)**
2020	Guest Lecturer for CSCI2254 Web Application Development at Boston College
2019	Guest Lecturer for two lectures of the CS187 Science Gateway Seminar at the University of Massachusetts Boston
2019	**Instructor for the CS460 Computer Graphics course at the University of Massachusetts Boston (new curriculum, Instructor rating: 4.81/5, Course rating: 4.57/5)**
2019	Guest Lecturer for the CMPSC131 Computer Science course at Suffolk University
2018–2019	TEALS Volunteer for AP Computer Science at Cambridge Rindge and Latin School
2016	Technical Assistant for the Deep Learning mini-course at the Harvard IACS Compute Fest
2015	Teaching Fellow for the Harvard CS171 Visualization course
2008	Workshop for Advanced Microcontroller Programming, University of Bratislava, Slovakia
2008	Workshop for Microcontroller Programming at the University of Tbilisi, Georgia (Europe)
2004–2008	Teaching Assistant for the Microcontrollers in EXperiment and LEarning (MEXLE) educational platform, Heilbronn University, Germany

Grants

2021	UMass Boston, Proposal Development Grant: **Towards Developing Deep Learning Approaches for Protein-Protein Interaction Detection**, Co-PI, $20,000
2021	National Institutes of Health, R21: **Real-time visualization and precision targeting in transcranial magnetic stimulation**, Co-PI, $156,663
2020	Massachusetts Life Sciences Center, Bits to Bytes: **The Oregon-Massachusetts Mammography Database (OMAMA-DB)**, PI, $749,834
2020	Federal Ministry of Education and Research Germany: International Future Labs for Artificial Intelligence in collaboration with the KIWI Biolab at the Technical University Berlin (covering 18 months exchange visits of a PostDoc and a Ph.D. student)
2019	NVidia Accelerated Data Science GPU Grant (1x Titan V100 GPU)

Awards

2020	Best Paper Award at EuroVis for Peax
2020	Spotlight Award at MIDL: Fast Mitochondria Detection for Connectomics
2020	AI Scientist of the Future for the KIWI Biolab at the Technical University Berlin, Germany
2015–2019	Winkler Scholarship
2013–2019	Harvard University Fellowship
2013	Real-Time Live! presentation of Slice:Drop at SIGGRAPH
2012	INCF Neuroinformatics Spotlight Award for XTK
2012	Mozilla Hacks WebGL Dev Derby Runner-up for Slice:Drop
2012	Visualizing.org VisWeek Challenge Winner with Slice:Drop
2010	1st Prize for End User Tutorial at the National Alliance of Medical Image Computing (NA-MIC)
2008–2009	Karl Steinbuch Foundation Scholarship
2007–2009	Thomas Gessmann Foundation Scholarship

Presentations

2021	Invited presenter at the **UMass Summit for AI, Data Science, and Robotics**
2020	Presenter at the **Creative Commons Global Summit**: *The 7 Levels of Open Science*
2020	Presenter at the **National Alliance for Medical Image Computing Project Week**: *Integrating TRAKO with 3D Slicer*
2020	Invited speaker at the **Fetal Neonatal Developmental Science Center, Boston Children's Hospital**: *Scientific Visualization at Scale!*
2020	Paper presentation at **International Conference on Medical Image Computing and Computer Assisted Intervention**: *TRAKO: Efficient Transmission of Tractography Data for Visualization*
2020	Invited speaker at the **Lymph Node Quantification Project, Harvard Medical School**: *Machine-Guided Annotation Methods*
2020	Paper presentation at **Medical Imaging with Deep Learning (MIDL)**: *Fast Mitochondria Detection for Connectomics*
2020	Invited presentation at the **UMass Boston-Dana Farber/Harvard Cancer Center initiative**: *Guided Tumor Detection and Annotation Methods for Cancer Imaging*
2020	Invited speaker at the **Massachusetts Life Sciences Center**: *The Oregon-Massachusetts Mammography Database*
2020	Invited researcher at **Shonan Meeting No. 167 in Japan**: *Formalizing Biological and Medical Visualization*
2019	Invited speaker at **Sarah Frisken's Lab, Harvard Medical School**: *Brain Connectivity, Machine Perception, and Computer Graphics - all at different scales!*
2019	Invited speaker at **Suffolk University**: *Brain Connectivity and Machine Perception*
2019	Invited speaker at the **MIT McGovern Institute**: *The Performance Gap between the Brain and AI*

Presentations (continued)

2018	Paper presentation at **IEEE Visualization**: *Evaluating 'Graphical Perception' with CNNs*
2018	**Harvard Visual Computing Group** meeting presentation: *The 7 Levels of Open Science*
2018	Invited speaker at **Brown University, Department of Computer Science**: *Analyzing Brain Connectivity and Computing Machine Perception*
2018	Invited speaker at **IBM Research** (AI Systems Day): *Evaluating 'Graphical Perception' with CNNs*
2017	**Harvard Visual Computing Group** meeting presentation: *Guided Proofreading of Automatic Segmentations for Connectomics*
2016	Invited speaker at the **IEEE Visualization Doctoral Colloquium**: *Proofreading for Connectomics*
2015	**Harvard Lichtman Lab** meeting presentation: *Interactive Proofreading Tools for Connectomics*
2014	Paper presentation at **IEEE Visualization**: *Design and Evaluation of Interactive Proofreading Tools for Connectomics*
2014	**Harvard Visual Computing Group** meeting presentation: *Proofreading Tools for Connectomics*
2014	Invited speaker at the **MIT Computer Graphics Group**: *Web-based Visualization of Scientific Data*
2014	**Harvard Visual Computing Group** meeting presentation: *Interactive Proofreading with Dojo*
2014	**Harvard Lichtman Lab** meeting presentation: *Web-based Visualization and Proofreading for Connectomics*
2013	**Harvard Visual Computing Group** meeting presentation: *Web-based Scientific Visualization*
2013	Invited speaker at **Visualizing Biological Data (VIZBI)**: *Physiology & Function*
2012	Spotlight presentation at **INCF Neuroinfomatics**: *Neuroimaging in the Browser using the X Toolkit*
2012	Invited speaker at **WebGL Camp Orlando**: *WebGL for Baby Brains*

Service and Outreach

2021	Program Committee member at the IEEE Visualization conference
2021	Faculty Mentor at the MGH Neuroimaging 2021 Virtual Symposium
2021	Organizer of the Chart Question Answering Workshop at CVPR 2021 in collaboration with Harvard, Columbia, Northwestern, and UMass Amherst
2021	NSF Reviewer for SBIR Panel 2021
2020–present	STEM Educational Excellence (STEM-EdX) Fellow
2020–present	Organizer of Events and Discord Server for CS+IT Students
2020	Program Committee member for short papers at the IEEE Visualization conference
2020	Member of the Paul English Scholarship Committee at the University of Massachusetts Boston
2020	Member of the Data Science Faculty Search Committee at the University of Massachusetts Boston
2019–present	Member of the Outreach and Publicity Committee in the Computer Science Department at the University of Massachusetts Boston
2019–present	Member of the Student Recruitment Committee in the Computer Science Department at the University of Massachusetts Boston

Service and Outreach (continued)

2019–present	Member of the Department Seminar Organization Team in the Computer Science Department at the University of Massachusetts Boston
2019–present	Voluntary Advisor for the AP Data Science Curriculum in Cambridge Public Schools
2019–2020	Technical Advisor of an Engineering E491/E492 Student Team at the University of Massachusetts Boston
2019–2020	Organizer of the bi-weekly social events Computer.Coffee for IT and CS students at the University of Massachusetts Boston
2018–2019	Head Coach for Cambridge Youth Soccer
2018	Volunteer+Presentation Facilitator at the Cambridge 8th Grade Science & Engineering Showcase
2013–2019	Social Media Coordinator at the Harvard Visual Computing Group
2018–present	Reviewer for *Manning Publications*
2016–present	**Reviewer for Frontiers in Neuroinformatics, ISMRM, Neuroinformatics, Frontiers in Neural Circuits, ACM SIGCHI, IEEE CVPR, IEEE Visualization / Transactions on Visualization and Computer Graphics, IEEE Access, MDPI Applied Sciences, Nature Communications Biology, Scientific Reports, Transactions on Pattern Analysis and Machine Intelligence, Nature, Computer & Graphics**
2013	Technical Reviewer for *Matsuda and Lea: WebGL Programming Guide, Addison-Wesley*
2014–present	Principal Investigator for multiple IRB approved research studies by the Harvard Human Research Protection Program
2007–2010	President of the Student Computer Club at Heilbronn University, StuWoNet e.V.
2007–2009	Voluntary Project Lead of RANDI2, a randomization software for clinical trials at the German Cancer Research Center (DKFZ), coordinating 15+ developers
1997–1999	Vice-President of The German Computer Freaks, a National Cyber Security Club

My Erdős Number is 3.