

# Çağatay Demiralp

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## Education

- Brown University**, Providence, RI 2012 (c. 2013)  
Ph.D., Computer Science  
Thesis Title: *Computational Brain Connectivity Using Diffusion MRI*  
Advisor: *David H. Laidlaw*  
Committee: *John F. Hughes (CS) and David B. Mumford (Applied Math)*
- Brown University**, Providence, RI 2004  
Sc.M., Computer Science
- Ege University**, İzmir, Turkey 2000  
B.S., Computer Engineering

## Research Experience

- MIT**, Cambridge, MA 2018 –  
Visiting Researcher, CSAIL
- IBM T. J. Watson Research Center**, Yorktown Heights, NY 2014–2018  
Research Staff Member
- Stanford University**, Stanford, CA 2012–2014  
Postdoctoral Scholar (Advisor: *Jeffrey Heer*), Computer Science Department
- Microsoft Research**, Cambridge, UK Sep–Nov 2011  
Research Intern, Machine Learning and Perception Group
- Brown University**, Providence, RI 2006–2012  
Graduate Researcher, Computer Science Department
- National Institutes of Health**, Bethesda, MD Nov–Dec 2004  
Research Fellow
- King's College London**, London, UK Jul–Sep 2004  
Visiting Researcher, Centre for Neuroimaging Sciences
- Brown University**, Providence, RI 2002–2004  
Graduate Researcher, Computer Science Department
- Brown University**, Providence, RI May–Sep 1999  
Undergraduate Researcher, Computer Science Department

## Conference Papers

- Kyrix: Interactive Visual Data Exploration at Scale. W. Tao, X. Liu, **Ç. Demiralp**, R. Chang, M. Stonebraker. Proc. CIDR, 2019.
- Clustrophile 2: Guided Visual Clustering Analysis. M. Cavallo, **Ç. Demiralp**. *IEEE Trans. Vis. Comput. Graphics (Proc. IEEE VAST)*, 2019.
- Data2Vis: Automatic Generation of Data Visualizations Using Sequence to Sequence Recurrent Neural Networks. V. Dibia, **Ç. Demiralp**. *IEEE VDS*, 2018 (**Best Paper Honorable Mention**).
- A Visual Interaction Framework for Dimensionality Reduction Based Data Exploration. M. Cavallo, **Ç. Demiralp**. *ACM Human Factors in Computing Systems (CHI)*, 2018.
- Track Xplorer: A System for Visual Analysis of Sensor-based Motor Activity Predictions. M. Cavallo, **Ç. Demiralp**. *Computer Graphics Forum (Proc. EuroVis)*, 2018.
- Foresight: Recommending Visual Insights. **Ç. Demiralp**, P. J. Haas, S. Parthasarathy, T. Pedapati. *VLDB*, 2017.
- Track Xplorer: A System for Visual Analysis of Sensor-based Motor Activity Predictions. M. Cavallo, **Ç. Demiralp**. *IEEE VIS DSIA*, 2017.
- Exploring Dimensionality Reductions with Forward and Backward Projections. M. Cavallo, **Ç. Demiralp**. *KDD IDEA*, 2017.
- Clustrophile: A Tool for Visual Clustering Analysis. **Ç. Demiralp**. *KDD IDEA*, 2016.
- The VERP Explorer: A Tool for Exploring Eye Movements of Visual-Cognitive Tasks Using Recurrence Plots. **Ç. Demiralp**, J. Cirimele, J. Heer, S. K. Card. *IEEE Vis Workshop on Eye Tracking and Visualization*, 2015.
- Learning Perceptual Kernels for Visualization Design. **Ç. Demiralp**, M. Bernstein, and J. Heer. *IEEE Trans. Vis. Comput. Graphics (Proc. IEEE InfoVis)*, 2014 (**Among Top 4 TVCG Papers Invited to SIGGRAPH'15**).
- invis*: Exploring High-Dimensional RNA Sequences from In Vitro Selection. **Ç. Demiralp**, E. Hayden, J. Hammerbacher, J. Heer. *Proc. BioVis*, 2013.
- Context-sensitive Classification Forests for Segmentation of Brain Tumor Tissues. D. Zikic, B. Glocker, E. Konukoglu, A. Criminisi, J. Shotton, D. H. Ye, **Ç. Demiralp**, O. Thomas, T. Das, R. Jena, S. Price. *MICCAI 2012 Challenge on Multimodal Brain Tumor Segmentation*, 2012.

Decision Forests for Tissue-specific Segmentation of High-grade Gliomas in Multi-channel MR. D. Zikic, B. Glocker, E. Konukoglu, A. Criminisi, **Ç. Demiralp**, J. Shatton, O. Thomas, T. Das, R. Jena, S. Price. *Proc. Med. Image. Comput. Comput. Assist. Interv. (MICCAI)*, 2012.

Generalizing Diffusion Tensor Model Using Probabilistic Inference in Markov Random Fields. **Ç. Demiralp** and D. H. Laidlaw. *Proc. Med. Image. Comput. Assist. Interv. (MICCAI) Workshop on Computational Diffusion MRI*, 2011.

Tract-based Probability Densities of Diffusivity Measures in DT-MRI. **Ç. Demiralp** and D. H. Laidlaw. *Proc. Med. Image. Comput. Assist. Interv. (MICCAI)*, 2010.

Similarity Coloring of DTI Fiber Tracts. **Ç. Demiralp** and D. H. Laidlaw. *Proc. Med. Image. Comput. Assist. Interv. (MICCAI) Workshop on Diffusion Modeling and the Fibre Cup*, 2009.

Surface Deformations Driven by Vector-Valued 1-Forms. G. Taubin and **Ç. Demiralp**. *Proc. SMI*, 2010.

Coloring 3D Line Fields Using Boy's Real Projective Plane Immersion. **Ç. Demiralp**, J. F. Hughes, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics (Proc. IEEE SciVis)*, 2009.

Exploring 3D DTI Fiber Tracts with Linked 2D Representations. R. Jianu, **Ç. Demiralp**, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics (Proc. IEEE SciVis)*, 2009.

Slicing-based Coherence Measure for Refining Clusters of 3D Curves. **Ç. Demiralp**, G. Shakhnarovich, S. Zhang, and D. H. Laidlaw. *Proc. Med. Image. Comput. Assist. Interv. (MICCAI)*, 2008.

Connectivity-aware Sectional Visualization of 3D DTI Volumes Using Perceptual Flat-Torus Coloring and Edge Rendering. **Ç. Demiralp**, S. Zhang, D. F. Tate, S. Correia, D. H. Laidlaw. *Eurographics*, 2006.

An Immersive Virtual Environment for DT-MRI Volume Visualization Applications: A Case Study. S. Zhang, **Ç. Demiralp**, D. F. Keefe, M. J. da Silva, D. H. Laidlaw, B. D. Greenberg, P. J. Basser, E. A. Chiocca, C. Pierpaoli, T. S. Deisboeck. *Proc. IEEE SciVis*, 2001.

Application of Virtual Reality to Visualization of DT-MRI Volumes. S. Zhang, **Ç. Demiralp**, D. F. Keefe, M. J. da Silva, D. H. Laidlaw, B. D. Greenberg, P. J. Basser, E. A. Chiocca, C. Pierpaoli, T. S. Deisboeck. *Proc. Med. Image. Comput. Assist. Interv. (MICCAI)*, 2001.

#### Journal Articles

Task Based Effectiveness of Basic Visualizations. B. Saket, A. Endert, **Ç. Demiralp**. *IEEE Trans. Vis. Comput. Graphics*, 2018.

Sampling for Scalable Visual Analytics. B. C. Kwon, J. Verma, P. J. Haas, **Ç. Demiralp**. *IEEE Computer Graphics & Applications*, 2017.

The Multimodal Brain Tumor Image Segmentation Benchmark (BRATS). Menze et al. *IEEE Trans. Med. Imag.*, 2015.

Visual Embedding: A Model for Visualization. **Ç. Demiralp**, C. Scheidegger, G. L. Kindlmann, D. H. Laidlaw, and J. Heer. *IEEE Computer Graphics & Applications*, 2014.

Exploring Brain Connectivity with Two-dimensional Neural Maps. R. Jianu, **Ç. Demiralp**, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics*, 2012.

A Qualitative and Quantitative Comparison of CAVE and Fishtank Virtual-Reality Displays. **Ç. Demiralp**, C. D. Jackson, D. B. Karelitz, S. Zhang, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics*, 2006.

In-vivo Measurement of Contact Areas and Ligament Lengths in the Distal Radioulnar Joint. G. E. Marai, D. H. Laidlaw, **Ç. Demiralp**, S. Andrews, C. M. Grimm, and J. J. Crisco. *IEEE Trans. Biomed. Eng.*, 2004.

Visualizing Diffusion Tensor MR Images Using Streamtubes and Streamsurfaces. S. Zhang, **Ç. Demiralp**, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics*, 2003.

#### Book Chapters

The VERP Explorer: A Tool for Exploring Eye Movements of Visual-Cognitive Tasks Using Recurrence Plots. **Ç. Demiralp**, J. Cirimele, J. Heer, S. K. Card. LNCS-Springer, 2017.

Exploring Brain Connectivity with Two-dimensional Maps. **Ç. Demiralp**, R. Jianu, and D. H. Laidlaw. *New Developments in the Visualization and Processing of Tensor Fields*. LNCS-Springer, 2012.

#### Unrefereed Publications

Exploring Brain Connectivity with Two-dimensional Neural Maps. **Ç. Demiralp**. *Visual Strategies: A Practical Guide to Graphics for Scientists and Engineers* by Felice C. Frankel and Angela H. DePace. Yale University Press, 2012.

Computational Topology. **Ç. Demiralp**. *Conduit*, Spring–Summer 2011.

Remembering Boy's Surface After 15 Years. J. F. Hughes and **Ç. Demiralp**. *Conduit*, Spring–Summer 2009.

#### Panels

Theories of Visualization—Are There Any? *IEEE Vis'11*

## Service

**PC Member** IEEE DSIA 2018, BioVis 2015 & 2016, MICCAI Workshop on Medical Computer Vision 2012 & 2015

**Reviewer** UIST, CHI, IEEE InfoVis, IEEE SciVis, IEEE TVCG, EuroVis, PacificVis, MICCAI

**Co-Chair** IBM Research Interaction PIC 2016 – 2018

## Teaching Experience

**Brown University**

Teaching Assistant & Lecturer, Computational Topology

Spring 2011

## Awards and Honors

VDS Best Paper Honorable Mention

2018

SIGGRAPH Top 4 IEEE TVCG Papers

2015

IEEE SciVis Best Poster Award

2010

Brown University Brain Science Graduate Research Award

2008

ASSH Best Scientific Content Award

2001

ASSH Best Layout and Presentation Award

2001

## Invited Talks

**Megagon Labs**, Mountain View, CA

*Improving Data Science Pipelines via Visual Analytics*

Sep 2018

**Facebook**, Cambridge, MA

*Improving Data Science Pipelines via Visual Analytics*

Sep 2018

**UMass**, Amherst, MA

*Improving Data Science Pipelines via Visual Analytics*

Jul 2018

**Two Sigma**, New York, NY

*Improving Data Science Pipelines via Visual Analytics*

Jul 2018

**Google Research**, New York, NY

*Better Interaction with Black-Box Machine Learning Models*

Mar 2018

**Brown University**, Providence, RI

*Better Interaction with Black-Box Machine Learning Models*

Mar 2018

**NLM Georgia Biomedical Informatics Course**, Young Harris, Georgia

*Data Visualization*

Apr 2017

**Microsoft Research**, New York, NY

*Learning Perceptual Kernels for Visualization Design*

Jun 2016

**Florida International University**, Miami, FL

*Visual Data Analysis: Perceptual Foundations and Applications*

May 2016

**SIGGRAPH**, Los Angeles, CA

*Learning Perceptual Kernels for Visualization Design*

Aug 2015

**Cornell University**, Ithaca, NY

*Visual Data Analysis: Perceptual Foundations and Biomedical Applications*

Mar 2015

**Schloss Dagstuhl**, Germany

*Probabilistic Models of Visualization Design Spaces*

Mar 2015

**Simons Foundation**, New York, NY

*Visualize First, Ask Questions Later:*

*How to Explore Thousands of Genomic Sequences Interactively*

Sep 2014

**Microsoft Research**, Redmond, WA

*Visual Embedding and Perceptual Kernels*

May 2014

**IBM T. J. Watson Research Center**, Yorktown, NY

*Visual Data Analysis: Perceptual Foundations and Biomedical Applications*

Apr 2014

**Schloss Dagstuhl**, Germany

*Visual Embedding: A Model for Visualization*

Feb 2014

**Sumo Logic**, Redwood City, CA

*Data Visualization and Graphical Perception*

Jul 2014

**Stanford University** (Guest Lecture in Biomedical Informatics—CS 272 by Russ Altman), CA

*Data Visualization: Examples from Biomedicine*

May 2013

**Harvard Medical School**, Boston, MA

*Computational Brain Connectivity Using Diffusion MRI*

Sep 2012

**University of Maryland**, Baltimore County, MD

*Computational Brain Connectivity Using Diffusion MRI*

Sep 2012

<b>Schloss Dagstuhl</b> , Germany <i>Cycles of Brain White Matter</i>	Dec 2011
<b>University College London</b> , London, UK <i>Exploring Brain Connectivity with Two-dimensional Neural Maps</i>	Nov 2011
<b>University of New Hampshire</b> , Durham, NH <i>Coloring 3D Line Fields Using Boy's Real Projective Plane Immersion</i>	May 2010
<b>Schloss Dagstuhl</b> , Germany <i>Manifold Ways of Coloring</i>	Jun 2009

#### References

**Stuart K. Card**, Stanford University  
**Dan Goldstein**, Microsoft Research NYC  
**Peter J. Haas**, UMass Amherst  
**Jeffrey M. Heer**, University of Washington  
**John F. Hughes**, Brown University  
**David H. Laidlaw**, Brown University  
**Michael Stonebraker**, MIT CSAIL