Fang-Cheng Yeh M.D. Ph.D.

Research Psychologist
Department of Psychology
Carnegie Mellon University
frankyeh@cmu.edu

EDUCATION

2014 **Ph.D.** in Biomedical Engineering, **Carnegie Mellon University**
Advisor: Chien Ho
Research focus: Validating cellular MRI using quantitative pathology
Thesis: Automated whole slide image analysis for animal research and clinical application

2006 **M.D. National Taiwan University**
Internship training focused on radiology and neurology

EXPERIENCE

2014–2016 **Postdoctoral Researcher & Research Psychologist**, Carnegie Mellon University
Advisor: Timothy Verstynen
Research focus: behavioral and neuropsychological correlates of white matter structure in human brain.

2007–2008 **Research Assistant**, National Taiwan University
Advisor: Wen-Yih Isaac Tseng
Research focus: diffusion MRI as imaging biomarker for brain disease.

2006–2007 **Army Doctor and Second Lieutenant**, Military Service, Taiwan

2005–2006 **Intern Doctor**, National Taiwan University Hospital

HONORS

2015 **Junior Fellow,** International Society for Magnetic Resonance in Medicine (ISMRM)

2009 **CIT Dean's Fellowship,** Carnegie Mellon University

2006 **Undergraduate Research Creativity Award,** National Science Council, Taiwan.

2005 **Presidential Award,** National Taiwan University

PATENTS

2014 "Voxel-Based Transformation Method for Transforming diffusion MRI Data And Groups Test Method Using The Same," US Patent (US8849001 B2, Issued)

2013 "MR diffusion weighted method and system providing microstructural information of a biological target using SINe cardinal (SINC) function and q-space sampling," US Patent (US8564289 B2, Issued)

2012 "Method of analyzing diffusion-weighted magnetic resonance image," US Patent (US8160339 B2, Issued)

INVITED TALKS

2014 "Diffusion MRI: A Potential Biomarker of Brain Diseases?", Department of Psychiatry, Stony Brook University, September, 16, 2014.

2012 "Mapping Brain Connectivity with Diffusion Spectrum Imaging: Group Study and Individual Analysis", Biomedical Magnetic Resonance Laboratory, Washington University in St. Louis, October 31, 2012.

2012 "Mapping Brain Connectivity with Diffusion MRI: Applications, Limitations, and Opportunities", Next Generation Medical Imaging Workshop, Carnegie Mellon University, Pittsburgh, PA, USA, September 6, 2012.

2011 "Diffusion Processing Using DSI Studio", MNTP Summer Workshop, Center for the Neural Basis of Cognition, Carnegie Mellon University, Pittsburgh, PA, USA, June 16, 2011.

TEACHING EXPERIENCE

2016	*Diffusion MRI Modality instructor*, Multimodal Neuroimaging Training Program (MNTP) Summer Workshop, Carnegie Mellon University
2015	*Instructor,* DTI Workshop, Comprehensive Neuroscience Center at the University of Alabama at Birmingham*,* 12/14-12/15, 2015*. (I taught a two-day workshop on diffusion MRI)*
2015 **2014**	*Modality instructor*, Multimodal Neuroimaging Training Program (MNTP) Summer Workshop, Carnegie Mellon University

GRANTS AND FELLOWSHIP

NIH R21 MH107052 John Pyle (PI)
Title: Understanding the neural bases of social perception within superior temporal sulcus
Role: Significant Contributor

NIH R01 NS089659 Jeongwon Jeong (PI) 3/1/2015-2/28/2019
Title: A Novel DWI Method to Minimize Postoperative Deficits in Pediatric Epilepsy Surgery.
Role: Consultant

NIH R01 DC013803 Juan Fernandez-Miranda (PI)
Title: Language Connectivity Pathways and Neuroplasticity in Aphasic Stroke Patients
Role: Consultant

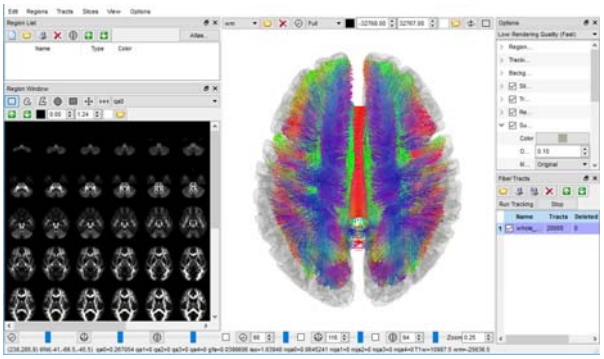
NSF IIS-1247658 Aarti Singh (PI) 1/1/2013-12/31/2016
Title: BIGDATA: Mid-Scale: DA: Distribution-based machine learning for high dimensional datasets
Role: Consultant

John and Claire Bertucci Fellowship, Carnegie Mellon University 2012
$10,000 USD. The fellowship is offered to graduate students to help with their tuition costs.

Studying Abroad Scholarship, Ministry of Education, Taiwan. 2008
$24,000 USD (stipend) and $26,000 USD (tuition).
The fellowship is offered to students studying abroad to cover their stipend and tuition costs.

SOFTWARE TOOL

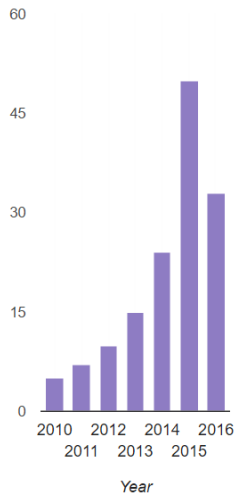
- **Diffusion MRI software—DSI Studio** (http://dsi-studio.labsolver.org):



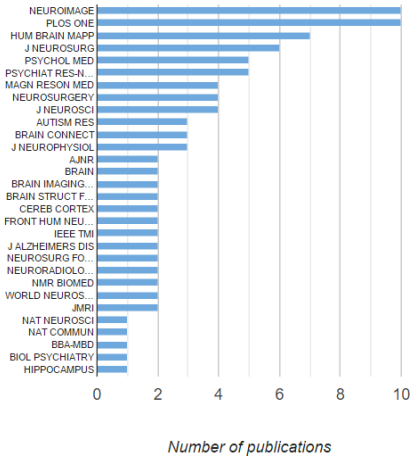
I developed "DSI Studio", an open source diffusion MRI analysis tool that maps brain connections. DSI Studio has been applied to human and animal studies to investigate how major fiber pathways are affected by neurological and psychiatric diseases.

There are widespread users from imaging centers and laboratories around the world. Since its debut in 2008, DSI Studio has been downloaded more than 20,000 times. In the year of 2015 alone, DSI Studio was used in more than 50 peer-reviewed publications. These journal papers are published in top-tier journals including Nature Neuroscience, Nature Communication, Brain, Cerebral Cortex, and NeuroImage.

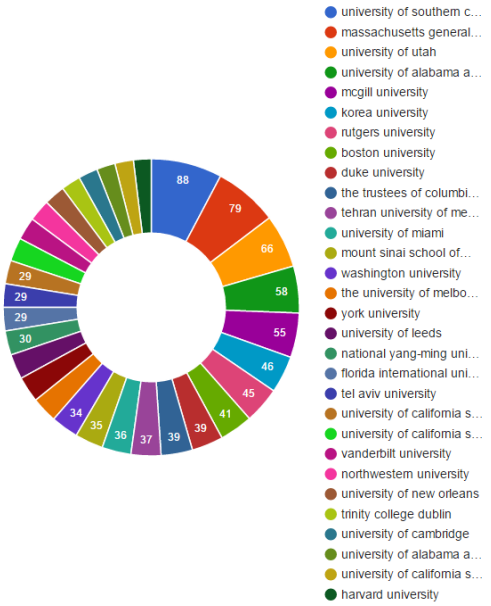
Journal Publications Using DSI Studio



Top 30 DSI Studio Citing Journals by Numbers of Publications



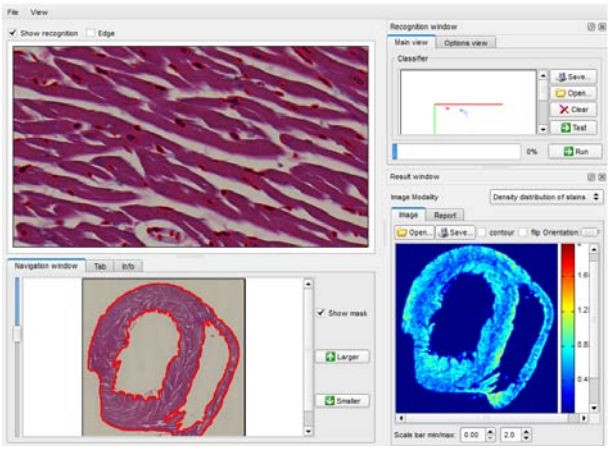
Top 20 Universities and Hospitals Visiting DSI Studio Website in the Past 100 Days (Generated Automatically by Google Analytics Report)



A complete list of the citing papers can be found at http://dsi-studio.labsolver.org/publications.

- **Pathology whole slide imaging analysis tool—WS Recognizer** (http://ws-recognizer.labsolver.org)

WS-Recognizer is an open-source pathology tool that uses whole slide image to recognize stains in the slides and present meaningful information. While traditional pathology is often limited by a field of view and may be biased due to its qualitative nature, the model pathology is moving toward quantitative analysis that adopts an automatic way to recognize the whole pathology slides. WS-Recognizer is a tool that allows users to retrieve pathology information and present it as a panoramic view of the tissue characteristics across the entire tissue section (see Figure).



PUBLICATIONS

	All	*Since 2011*
Citations	871	847
h-index	16	16
i10-index	18	18

Source: http://scholar.google.com/citations?user=QdfsoJ4AAAAJ&hl=en

Peer-reviewed Journal Articles

***corresponding author**

2016

1. Meola A, **Yeh FC**, Fellows-Mayle W, Weed J, Fernandez-Miranda JC. Human Connectome-Based Tractographic Atlas of the Brainstem Connections and Surgical Approaches. *Neurosurgery*. accepted, 2016. (IF=3.620)
2. **Yeh FC***, Liu L, T Hitchens K, Wu Y. Mapping Immune Cell Infiltration Using Restricted Diffusion MRI. *Magnetic Resonance in Medicine*, accepted, 2016. (IF=3.571)
3. Yoshino M, Abhinav K, **Yeh FC**, Panesar S, Fernandes D, Pathak S, Gardner PA, Fernandez-Miranda JC. Visualization of cranial nerves using high-definition fiber tractography. *Neurosurgery*, accepted, 2016. (IF=3.620)
4. **Yeh FC***, Badre D, Verstynen T. Connectometry: A statistical approach harnessing the analytical potential of the local connectome. *Neuroimage*. 2016 Jan 15;125:162-71. (IF=6.357)
5. Olvet DM, Delaparte L, **Yeh FC**, DeLorenzo C, McGrath PJ, Weissman MM, Adams P, Fava M, Deckersbach T, McInnis MG, Carmody TJ. A comprehensive examination of white matter tracts and connectometry in major depressive disorder. *Depression and anxiety*. 2016 33(1):56-65. (IF=4.407)
6. Wang X, Pathak S, Stefaneanu L, **Yeh FC**, Li S, Fernandez-Miranda JC. Subcomponents and connectivity of the superior longitudinal fasciculus in the human brain. *Brain Structure and Function*. 2016; 221(4):2075-92. (IF=4.567)

2015

7. Meola A, Comert A, **Yeh FC**, Stefaneanu L, Fernandez-Miranda JC. The controversial existence of the human superior fronto-occipital fasciculus: Connectome-based tractographic study with microdissection validation. *Human brain mapping*. 2015 Dec 1;36(12):4964-71. (IF=5.969)
8. Beukema P, **Yeh FC**, Verstynen T,. In vivo characterization of the connectivity and subcomponents of the human globus pallidus. *Neuroimage*, 120 (15): 382-393, 2015. (IF=6.357)
9. Meola A, Comert A, **Yeh FC**, Sivakanthan S, Fernandez-Miranda JC. The nondecussating pathway of the dentatorubrothalamic tract in humans: human connectome-based tractographic study and microdissection validation. *Journal of neurosurgery*. 2015, 124(5):1406-12. (IF= 3.227)
10. Abhinav K, **Yeh FC**, Mansouri A, Zadeh G, Fernandez-Miranda JC. High-definition fiber tractography for the evaluation of perilesional white matter tracts in high-grade glioma surgery. *Neuro-oncology*. 2015 Sep 1;17(9):1199-209. (IF= 5.286)
11. Faraji AH, Abhinav K, Jarbo K, **Yeh FC**, Shin SS, Pathak S, Hirsch BE, Schneider W, Fernandez-Miranda JC, Friedlander RM. Longitudinal evaluation of corticospinal tract in patients with resected brainstem cavernous malformations using high-definition fiber tractography and diffusion connectometry analysis: preliminary experience. *Journal of neurosurgery*. 2015 Nov;123(5):1133-44. (IF= 3.227)

2014

12. Abhinav K, **Yeh FC**, Pathak S, Suski V, Lacomis D, Friedlander RM, Fernandez-Miranda JC. Advanced diffusion MRI fiber tracking in neurosurgical and neurodegenerative disorders and neuroanatomical studies: A review. *Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease*. 2014 Nov 30;1842(11):2286-97. (IF=5.089)

13. **Yeh FC**, Parwani AV, Pantanowitz L, Ho C. Automated grading of renal cell carcinoma using whole slide imaging. *Journal of pathology informatics*. 2014;5:23.

14. **Yeh FC**, Ye Q, Hitchens TK, Wu YL, Parwani AV, Ho C. Mapping stain distribution in pathology slides using whole slide imaging . *Journal of pathology informatics*. 2014;5:1.

15. Abhinav K, **Yeh FC**, El-Dokla A, Ferrando LM, Chang YF, Lacomis D, Friedlander RM, Fernandez-Miranda JC. Use of diffusion spectrum imaging in preliminary longitudinal evaluation of amyotrophic lateral sclerosis: development of an imaging biomarker. Frontiers in human neuroscience. 2014;8. (IF=2.895)

16. Kent BP, Rinaldo A, **Yeh FC**, Verstynen T. Mapping Topographic Structure in White Matter Pathways with Level Set Trees. *PloS one*. 2014 Apr 8;9(4):e93344. (IF=3.54)

17. Fernández-Miranda JC, Wang Y, Pathak S, Stefaneau L, Verstynen T, **Yeh FC**. Asymmetry, connectivity, and segmentation of the arcuate fascicle in the human brain. *Brain Structure and Function*. 2014;220(3):1665-80. (IF=4.567)

18. Abhinav K, Pathak S, Richardson RM, Engh J, Gardner P, **Yeh FC**, Friedlander RM, Fernandez-Miranda JC. Application of High-Definition Fiber Tractography in the Management of Supratentorial Cavernous Malformations: A Combined Qualitative and Quantitative Approach. *Neurosurgery*. 2014 Jun 1;74(6):668-81. (IF=3.031)

2013

19. **Yeh FC**, Verstynen TD, Wang Y, Fernández-Miranda JC, Tseng WY. Deterministic diffusion fiber tracking improved by quantitative anisotropy. *PLOS One*, 8(11): e80713 , 2013. (IF=3.54)

20. **Yeh FC**, Tseng W. YI (2013) Sparse Solution of Fiber Orientation Distribution Function by Diffusion Decomposition. *PLOS One*. 2013 Oct 1;8(10):e75747. (IF=3.54)

21. Wu YL, Ye Q, Eytan DF, Liu L, Rosario BL, Hitchens TK, **Yeh FC**, Ho C. Magnetic resonance imaging investigation of macrophages in acute cardiac allograft rejection after heart transplantation. *Circulation: Cardiovascular Imaging*. 2013 Nov 1;6(6):965-73. (IF=6.752)

22. **Yeh FC**, Tang PF, Tseng WY. Diffusion MRI connectometry automatically reveals affected fiber pathways in individuals with chronic stroke. *NeuroImage: Clinical*. 2013 Dec 31;2:912-21. (IF=2.526)

23. Liu L, Hitchens TK, Ye Q, Wu Y, Barbe B, Prior DE, Li WF, **Yeh FC**, Foley LM, Bain DJ, Ho C. Decreased reticuloendothelial system clearance and increased blood half-life and immune cell labeling for nano-and micron-sized superparamagnetic iron-oxide particles upon pre-treatment with Intralipid. *Biochimica et Biophysica Acta (BBA)-General Subjects*. 2013 Jun 30;1830(6):3447-53. (IF=3.829)

24. Jeong JW, Asano E, **Yeh FC**, Chugani DC, Chugani HT. Independent component analysis tractography combined with a ball–stick model to isolate intravoxel crossing fibers of the corticospinal tracts in clinical diffusion MRI. *Magnetic Resonance in Medicine*. 2013 Aug 1;70(2):441-53. (IF=3.398)

25. Kuo LW, Chiang WY, **Yeh FC**, Wedeen VJ, Tseng WY. Diffusion spectrum MRI using body-centered-cubic and half-sphere sampling schemes. *Journal of neuroscience methods*. 2013 Jan 15;212(1):143-55. (IF=1.959)

26. Wang Y, Fernández-Miranda JC, Verstynen T, Pathak S, Schneider W, **Yeh FC**. Rethinking the role of the middle longitudinal fascicle in language and auditory pathways. *Cerebral cortex*. 2012 Aug 8:bhs225. (IF=8.305)

2012

27. Fernandez-Miranda JC, Pathak S, Engh J, Jarbo K, Verstynen T, **Yeh FC**, Wang Y, Mintz A, Boada F, Schneider W, Friedlander R. High-definition fiber tractography of the human brain: neuroanatomical validation and neurosurgical applications. *Neurosurgery*. 2012 Aug 1;71(2):430-53. (IF=3.031)

28. **Yeh FC**, Cheng JZ, Chou YH, Tiu CM, Chang YC, Huang CS, Chen CM. Stochastic region competition algorithm for Doppler sonography segmentation. *Medical physics*. 2012 May 1;39(5):2867-76. (IF=3.012)

2011

29. Wang Y, Wang Q, Haldar JP, **Yeh FC**, Xie M, Sun P, Tu TW, Trinkaus K, Klein RS, Cross AH, Song SK. Quantification of increased cellularity during inflammatory demyelination. *Brain*. 2011 Dec 1;134(12):3590-601. (IF=10.226)

30. **Yeh FC**, Tseng WY. NTU-90: a high angular resolution brain atlas constructed by q-space diffeomorphic reconstruction. *Neuroimage*. 2011 Sep 1;58(1):91-9. (IF=6.132)

31. Chiu CH, Lo YC, Tang HS, Liu IC, Chiang WY, **Yeh FC**, Jaw FS, Tseng WY. White matter abnormalities of fronto-striato-thalamic circuitry in obsessive–compulsive disorder: a study using diffusion spectrum imaging tractography. *Psychiatry Research: Neuroimaging*. 2011 Jun 30;192(3):176-82. (IF=2.831)

32. Lo YC, Soong WT, Gau SS, Wu YY, Lai MC, **Yeh FC**, Chiang WY, Kuo LW, Jaw FS, Tseng WY. The loss of asymmetry and reduced interhemispheric connectivity in adolescents with autism: a study using diffusion spectrum imaging tractography. *Psychiatry Research: Neuroimaging*. 2011 Apr 30;192(1):60-6. (IF=2.831)

33. **Yeh FC**, Wedeen VJ, Tseng WY. Estimation of fiber orientation and spin density distribution by diffusion deconvolution. *Neuroimage*. 2011 Apr 1;55(3):1054-62. (IF=6.132)

2010

34. Cheng JZ, Chou YH, Huang CS, Chang YC, Tiu CM, **Yeh FC**, Chen KW, Tsou CH, Chen CM. ACCOMP: augmented cell competition algorithm for breast lesion demarcation in sonography. *Medical physics*. 2010 Dec 1;37(12):6240-52. (IF=3.012)

35. **Yeh FC**, Wedeen VJ, Tseng WY. Generalized-sampling imaging. *IEEE Transactions on Medical Imaging*. 2010 Sep;29(9):1626-35. (IF=3.799)

36. Tang PF, Ko YH, Luo ZA, **Yeh FC**, Chen SH, Tseng WY. Tract-specific and region of interest analysis of corticospinal tract integrity in subcortical ischemic stroke: reliability and correlation with motor function of affected lower extremity. *American Journal of Neuroradiology*. 2010 Jun 1;31(6):1023-30. (IF=3.675)

Selected Conference Proceedings

1. **Yeh FC**, Ho C. Mapping Immune Cells Infiltration Using Restricted Diffusion MRI. *40th Annual Northeast Bioengineering Conference*, Boston, 2014. (**Oral Presentation**)

2. **Yeh FC**, Ye Q, Hitchens TK, Wu YL, Parwani AV, Ho C**.** An Automated Algorithm for Assessing Cell Distribution in Cardiac Tissue Slides Digitized Using Whole Slide Imaging. *Pathology Informatics*, Boston, 2010. (**Best Presentation Award**)

3. **Yeh FC**, Wedeen VJ, Tseng WY. Practical crossing fiber imaging with combined DTI datasets and generalized reconstruction algorithm. *The 17th Annual Meeting, International Society for Magnetic Resonance in Medicine*, Honolulu, 2009, p. 365 (**Oral Presentation**)
4. **Yeh FC**, Wedeen VJ, Tseng WY. A recursive algorithm to decompose orientation distribution function and resolve intra-voxel fiber directions. *The 16th Annual Meeting of the International Society for Magnetic Resonance in Medicine*, May 3rd-9th, 2008, Toronto, Canada. (**Oral Presentation**)

PROFESSIONAL SERVICES

Ad hoc reviewer: Neuroimage, Neurosurgery, Frontier in Neuroscience, PLOS One, Medical Physics, Computer Methods and Programs in Biomedicine, Journal of Magnetic Resonance Imaging, Neurological Sciences.