

JAMES JS NORTON

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EDUCATION

- Ph.D. in Neuroscience, University of Illinois – Urbana, IL** **Expected August 2016**
- Advised by Timothy Bretl Ph.D.
- B.S. in Psychology, University of Florida – Gainesville, FL** **2010**
- Mainland High School – Daytona Beach, FL** **2001**

RESEARCH AND PROFESSIONAL EXPERIENCE

- Research Assistant – Bretl Research Group** **2010-Present**
University of Illinois at Urbana Champaign – Urbana, IL
- Leading a team of 8-10 graduate and undergraduate students in research with two goals: (1) understanding the neural mechanisms that lead to the generation of steady-state visual evoked potentials in the brain and (2) applying our knowledge of these neural mechanisms to the development of steady-state visual evoked potential based brain-computer interfaces.
 - Co-developed one of the fastest steady-state visual evoked potential based brain-computer interfaces for text entry ever produced, achieving an input rate of greater than 20 characters per minute.
 - Demonstrated the use of novel “epidermal” electronic sensors for recording electroencephalography over periods of up to two weeks, enabling brain-computer interfaces that can be worn for extended periods of time.
 - To date this research has more than doubled the performance of steady-state visual evoked potential based brain-computer interfaces, resulted in six peer-reviewed publications with researchers from three different colleges, and involved mentoring more than 40 undergraduate students.
 - Supervisor: Timothy Bretl Ph.D.
- Programmer Analyst – Abt Associates – Cambridge, MA** **2010-2012**
- Proposed and developed web tools for the United States Environmental Protection Agency’s Office of Enforcement and Compliance Assurance to improve transparency of states’ compliance with federal environmental regulations.
 - Designed and implemented the first “state dashboards” to visualize state compliance performance for the Office of Enforcement and Compliance Assurance’s *Enforcement and Compliance History Online* website.

- *Enforcement and Compliance History Online* website recognized by Obama administration as an example of best practices for transparent regulatory oversight.
- Supervisor: Matt Malachowski

Associate Programmer Analyst – Abt Associates – Cambridge, MA **2006-2010**

- Provided web programming, technical consulting, and prototype design for contractor working with the United States Environmental Protection Agency.
- Maintained, expanded, and improved websites for the United States Environmental Protection Agency's Office of Enforcement and Compliance Assurance, Tribal Portal, and Toxics Release Inventory Program.
- The number of searches performed on the Office of Enforcement and Compliance Assurance's *Enforcement and Compliance History Online* website nearly doubled from 2006-2010 to more than 1,000,000 searches per year.
- Supervisor: David Pulaski

Recruitment Director – Cognitive Neuroscience Laboratory **2006**
University of Florida – Gainesville, FL

- Recruited individuals from the community to participate in studies investigating emotional reactivity and emotional expression.
- Used laboratory's extensive participant database to schedule, screen, and enroll individuals with and without movement disorders, such as Parkinson's disease and essential tremor.
- Data collected during these studies resulted in multiple publications, including an article in *Brain*, and a better understanding of emotional reactivity in those with Parkinson's disease.
- Supervisor: Dawn Bowers Ph.D.

Laboratory Manager – Cognitive Neuroscience Laboratory **2004-2006**
University of Florida – Gainesville, FL

- Oversaw the daily operations of the Bowers Cognitive Neuroscience Laboratory.
- Supervised more than a dozen undergraduate research assistants, oversaw experimental participant screening, co-constructed the clinical neuropsychology website, assisted in data collection, and maintained the laboratory's experimental equipment.
- Data collection activities resulted in direct participation and co-authorship of four conference publications.
- Supervisor: Dawn Bowers Ph.D.

TEACHING EXPERIENCE

Teaching Assistant – ECE445 – Electrical and Computer Engineering **Fall 2015**
Senior Design, University of Illinois at Urbana Champaign – Urbana, IL

- Project-based learning course for senior undergraduate students in which they propose, design, and implement hardware and software to solve real-world engineering problems.
- Act as project manager for 3-5 individual project teams consisting of 2-3 students each, hold weekly progress update meetings, grade assignments, and facilitate interactions with external mentors.
- By the end of the semester, students will demonstrate a working prototype, justify their engineering decisions during an oral presentation, and document their conclusions in a final

report.

- Supervisor: P. Scott Carney Ph.D.

**Teaching Assistant - ECE398PSC - Special Topics in Electrical and
Computer Engineering, University of Illinois at Urbana Champaign –
Urbana, IL**

Fall 2015

- A project-based learning course that introduces undergraduate students to the engineering design process.
- Provide guidance to groups of students on how to: (1) identify engineering problems, (2) propose solutions, (3) design prototypes, and (4) empirically verify requirements.
- At the end of the semester, students will have completed at least two full iterations of the engineering design process.
- Supervisor: P. Scott Carney Ph.D.

**Teaching Assistant - MCB251 – Experimental Techniques in Molecular
Biology, University of Illinois at Urbana Champaign – Urbana, IL**

**Fall 2011,
Spring 2012**

- Sophomore level undergraduate course of 20-25 students that introduces experimental techniques used in molecular biology.
- Provided students with materials to introduce them to each technique, supplement with in-class instruction, and then provide feedback during hands-on exercises.
- Rated as excellent by the students in “Overall Teaching Effectiveness” for both the Fall 2011 and Spring 2012 terms.
- Supervisor: Nicholas Kirchner

JOURNAL PUBLICATIONS

Tanner, D., **Norton, J.J.S.**, Morgan-Short, K., Luck, S. (2015). *On high-pass filter artifacts (they're real) and baseline correction (it's a good idea) in ERP/ERMF analysis*. Submitted to the Journal of Neuroscience Methods.

Norton, J.J.S., Lee, D.S., Lee, J.W., Lee, W., Kwon, O., Won, P., Jung, S.Y., Cheng H., Jeong J.W., Akce, A., Umunna, S., Kwon, Y.H., Wang, X., Huang, Y., Bretl, T., Yeo, W.H., & Rogers, J.A. (2014). *Soft, curved electrode systems capable of integration on the auricle as a persistent brain-computer interface*. Proceedings of the National Academy of Sciences 112.13 (2015): 3920-3925.

Akce, A., **Norton, J.J.S.**, Bretl, T. (2014) *An SSVEP-based Brain-Computer Interface for Text Spelling using Adaptive Queries that Maximize Information Gain Rates*. IEEE Transactions on Neural Systems and Rehabilitation Engineering.

Jeong, J. W., Yeo, W. H., Akhtar, A., **Norton, J. J. S.**, Kwack, Y. J., Li, S., Rogers, J. A. (2013). *Materials and optimized designs for human-machine interfaces via epidermal electronics*. Advanced Materials, 25(47), 6839.

CONFERENCE PUBLICATIONS (PEER REVIEWED)

Norton, J.J.S., Mullins, J., Johnson, E., Choudhary, O., Bretl, T., Shin, C. (2015). *"OK Brain": A comparison of speech, touch, and SSVEP-based BCI inputs for head-mounted displays*. Submitted to the 2016 Conference on Human Factors in Computing Systems.

Akhtar, A., **Norton, J.J.S.**, Kasraie, M., & Bretl, T. (2014, August). *Playing checkers with your mind: An interactive multiplayer hardware game platform for brain-computer interfaces*. In Engineering in Medicine and Biology Society (EMBC), 2014 36th Annual International Conference of the IEEE (pp. 1650-1653). IEEE.

Awni, H., **Norton, J.J.S.**, Umunna, S., Federmeier, K., Bretl (2013). *Towards a Brain Computer Interface Based on the N2pc Event-Related Potential*. Presented at the 2013 IEEE Conference on Neural Engineering.

Johnson, E. C., **Norton, J.J.S.**, Jun, D. M., Bretl, T., & Jones, D. L. (2013, August). *Sequential Selection of Window Length for Improved SSVEP-Based BCI Classification*. Engineering in Medicine and Biology Society (EMBC), 35th Annual International Conference of the IEEE, Osaka, Japan.

Akce, A., **Norton, J.J.S.**, Bretl, T. (2012) *An EEG-based Brain-Computer Interface for Indoor Navigation Along Human-like Paths*. Presented at the 2012 International Conference on Intelligent Robots and Systems.

CONFERENCE PUBLICATIONS (NOT PEER REVIEWED)

Rommers, J., Dickson, D. S., **Norton, J. J. S.**, Wlotko, E. W., & Federmeier, K. D. (2015). *Frontal theta and disconfirmed predictions*. Poster presented at the Society for the Neurobiology of Language, Oct 15-17, Chicago, USA.

Rommers, J., Dickson, D. S., **Norton, J. J. S.**, Wlotko, E. W., & Federmeier, K. D. (2015). *Frontal theta and disconfirmed predictions in language*. Poster presented at the Psychonomic Society, Nov 19-22, Chicago, USA.

Rommers, J., Dickson, D. S., **Norton, J. J. S.**, Wlotko, E. W., & Federmeier, K. D. (2015). *Frontal theta and disconfirmed predictions in the language domain*. Poster to be presented at the 55th Annual Meeting of the Society for Psychophysiological Research (SPR), Sept 30-Oct 4, Seattle, USA.

Norton, J.J.S., Umunna, S., Bretl, T. (November, 2014) *Steady-state visually evoked potentials as a method for measuring visual information processing during sleep*. Presented at the 2014 Society for Neuroscience Annual Meeting.

Norton, J.J.S., Haas, S., Beshers, C., Umunna, S., Bretl, T. (November, 2013) *Keep your attention on the ball, a small twist on the old adage*. Presented at the 2013 Society for Neuroscience Annual Meeting.

Norton, J.J.S., Matthews, D., Jaina, G., Hsiang, K.C., Vaidya, B., Jones, D.L., Bretl, T. (October, 2012) *Development of a 60hz 'Wand' for the Detection of Power Line Noise*. Presented at the 2012 Society for Neuroscience Annual Meeting.

Akhtar, A., **Norton, J.J.S.**, Beshers, B., Bretl, T. (October, 2012) *Improving EMG-based gesture control by using symmetric bimanual gestures*. Presented at the 2012 Society for Neuroscience Annual Meeting.

Norton, J.J.S., Akhtar, A., Steines, D., Bretl, T. (March, 2011) *Volitional Control of the Steady State Visually Evoked Potential Using Auditory Feedback*. Presented at the 2011 Coordinated Science Laboratory Student Conference.

Mikos, A.E., Miller, K., Gadwal, S., **Norton, J.J.S.**, Okun, M., & Bowers, D. (August, 2006) *Emotional Modulation of the Startle Eyeblink Response in Essential Tremor*. Presented at the 2006 Convention of the American Psychological Association.

Okun, M., Mikos, A., Gadwal, S., **Norton, J.J.S.**, Fernandez, H., Rodrigues, R., & Bowers, D. (2006) *Enhanced startle with dopaminergic administration in subjects with Parkinson disease*. International Parkinson Congress, Kyoto, Japan.

Springer, U., Conwell, E., Rosas, A., **Norton, J.J.S.**, Bowers, D. *Investigating facial movement asymmetries in the spontaneous expression of positive and negative emotion*. Presented at the 35th Annual Meeting of the International Neuropsychological Society, Portland, Oregon.

Springer, U. S., **Norton, J.J.S.**, Rosas, A., McGetrick, J., Bowers, D. (February, 2005) *Modulation of Emotional Reactivity via Semantic Knowledge of Famous Faces*. Presented at the 33rd Annual Meeting of the International Neuropsychological Society, St. Louis, Missouri.

UNDERGRADUATE MENTORING

Mythri Anumula – ECE – Undergraduate Research Assistant	2015-Present
Birgit Altiz – ECE – Undergraduate Research Assistant	2015-Present
Melissa Jin – Computer Science – Undergraduate Research Assistant	2015
Anthony De Roo – ECE – Undergraduate Research Assistant	2015
Kyra Michon – MCB – Undergraduate Research Assistant	2015
Ojasvi Choudhary – ECE – Undergraduate Research Assistant and Senior Thesis	2013-Present
Yu-Jeh Liu – ECE – Undergraduate Research Assistant	2013-2015
Jayanth Alangar – ECE – Undergraduate Research Assistant	2013-2015
Chris Yim – ECE – Undergraduate Research Assistant	2013-Present
Sasirekha Pandravada – MCB – Undergraduate Research Assistant	2013-Present
Nisha Patel – MCB – Undergraduate Research Assistant	2013-Present
Braden Ming Fong – ECE – Undergraduate Research Assistant	2013-2014
Nahn Huynh – ECE – Undergraduate Research Assistant	2013-Present
Clarence Elliott – Computer Science – Undergraduate Research Assistant	2013-2014
Gabriel Hruskovec – ECE – Undergraduate Research Assistant	2013-2014
Kevin Steinhauer – Psychology – Undergraduate Research Assistant	2013-2014
Andrew Otto – Computer Science – Undergraduate Research Assistant	2013
Bonnie Chen – ECE – Senior Design Project	2012-2013

Randy Lefkowitz – ECE – Senior Design Project	2012-2013
Siyuan Wu – ECE – Senior Design Project	2012-2013
Xuanyu Zhong – ECE – Senior Design Project (Research Award)	2012-2013
Shiyang Liu – ECE – Senior Design Project (Research Award)	2012-2013
Yujie Jaina – ECE – Senior Design Project (Research Award)	2012-2013
Sean Yen – ECE – Senior Thesis	2012-2015
Hani Awni – Computer Science – Senior Thesis	2012-2014
Gary Hendricks – MCB – Undergraduate Research Assistant	2012-2014
Catya Mesyef – MCB – Undergraduate Research Assistant	2012-2014
Sylvia Haas – Computer Science – Undergraduate Research Assistant	2012-2014
Caroline Beshers - University High School Intern	2012-2013
Nathan Murray – ECE – Senior Design Project (Best Engineered Award)	2012
Todd Pixton – ECE – Senior Design Project (Best Engineered Award)	2012
Matt Lurie – ECE – Senior Design Project	2012
Kyle Spesard – ECE – Senior Design Project	2012
Gaurav Jaina – ECE – Senior Design Project (Electromagnetism Award)	2011-2012
Kuei-Cheng Hsiang – ECE – Senior Design Project (Electromagnetism Award)	2011-2012
Bhaskar Vaidya – ECE – Senior Design Project (Electromagnetism Award)	2011-2012
Anthony Majewski – ECE – Undergraduate Research Assistant	2011-2012
Kevin McDonald – MCB – Undergraduate Research Assistant	2011-2012
Raeed Chowdhury – ECE – Senior Thesis	2011
Se-Jun Chung – ECE – Senior Thesis	2011
Stephen Umunna – MCB – Undergraduate Research Assistant	2010-2014

GRANTS AND FUNDING

Organizer, “*Rapid Prototyping of Human-Computer Interfaces: The Development of an Interdisciplinary Community*,” Program Grant, University of Illinois at Urbana Champaign, \$15,000, 2012-2013.

National Science Foundation Integrative Graduate Education and Research Traineeship Fellow in Neuroengineering, University of Illinois at Urbana Champaign, 2012-2014.

Organizer, “*International Collaborative Research Experience in Neuroengineering*,” Program Grant, University of Illinois at Urbana Champaign, \$15,000, 2011-2012.

PROFESSIONAL SKILLS AND CERTIFICATIONS

Programming (Proficient) – MATLAB, HTML/CSS, Arduino

Programming (Familiar) – Python, PHP, SQL, JavaScript, LaTeX

Software Packages – Adobe Photoshop, Adobe InDesign, Adobe Premiere, Microsoft Office, Eclipse, SPSS, Linux

Technical Skills – Digital signal processing, psychophysiology, applied machine learning, computer vision

Certifications – Certificate in Business, University of Illinois, 2014.

AWARDS AND SERVICE

Editor, *Neuronews*, University of Illinois at Urbana-Champaign Neuroscience Program. 2012-2015.

Organizer, “*First Annual IGERT Neuroengineering Symposium*,” University of Illinois at Urbana-Champaign Neuroengineering. 2011.

Web design work for EPA’s ECHO website recognized by President Obama as an example of federal best practices for open government. 2011.

Boston Partners for Education, “*Power Lunch: Reading Mentors for Elementary School Students*”. 2008-2010.

Eagle Scout, Boy Scouts of America. 2001.

AP Scholar for completion of eight Advanced Placement exams. 2001.