

John LaRocco

www.johnlarocco.com

<https://sg.linkedin.com/in/john-larocco-38402224>

Telephone: US: +1-(856) 228-1509
SG: +65-81780550

Email: john.larocco@nzbri.org

RESEARCH EXPERIENCE:

Jeju National University, Jeju, South Korea, March 2019-January 2020

Evaluated EEG in animal subjects after focused ultrasound stimulation to increase blood-brain barrier permeability.

Automated Annotation of EEG, U. of Texas San Antonio, San Antonio, Texas, USA, December 2015-April 2017

Investigated methods to automatically detect nonstationary spectral features in EEG.

Exploratory development of a full-body prosthetic for head and organ transplantation, Aberdeen, MD, USA, October 2016-January 2017

Designed, fabricated, and delivered a batch of full-body prosthetic prototypes for animal subjects to a collaborator's lab.

Detection of Microsleeps from the EEG via Optimized Classification Techniques, U. of Canterbury, Christchurch, NZ, May 2012-October 2015

Implemented a modular software toolset, including a range of feature reduction and classifier structures, for EEG-based detection of microsleep events.

Implementation of a Simulated Artificial Circulatory System for Isolated Brain Sustenance on Arduino, U. of Canterbury, Christchurch, NZ, 2015

Proposed a control framework for an isolated brain life support system with negative feedback, and implemented an Arduino-based model.

Design of a Digital Currency for Basic Income, U. of Canterbury, Christchurch, NZ, 2014

Proposed a digital complementary currency pegged to New Zealand dollar for universal basic income, and oversaw deployment of software prototype.

Simulated Testing of a 3D Printed Revolver Cylinder, U. of Canterbury, Christchurch, NZ, 2013

Designed a computer model of a 3D printed double-action revolver for forensic investigation, and simulated frame deformations resulting from cartridge firing.

Device Research, U. of Delaware, Newark, DE, Fall 2010/Autumn 2011

Designed and fabricated spintronics devices for sensing bioparticles.

Effects of Mental Training on BCI Performance With Distraction, Rowan U., Glassboro, NJ, 2010

Compared performances of experimental (meditation) and control (non-meditation) groups on cognitive tests and EEG driven BCI.

Fight Simulator, TCNJ, Ewing, NJ, Fall 2007/Spring 2008

Built an apparatus to model impacts from fighting-based sports.

Biosignal Virtual Interface, TCNJ, Ewing, NJ, Spring 2008

Designed a virtual machine driven by two independent EMG biosignals.

Introduction to Biomaterials, TCNJ, Ewing, NJ, Autumn 2007

Modeled a drug-eluting arterial stent.

Biomechanics, TCNJ, Ewing, NJ, Spring 2008

Designed a prosthetic hip implant for a broken femur.

Thermodynamics I, TCNJ, Ewing, NJ, Fall 2006

Modeled an “ideal firearm” in terms of chemical energy necessary for bullet mass and velocity.

TEACHING EXPERIENCE:

Machine Learning for Signal Processing, Jeju National University, Ocean Systems Eng, Spring 2019

Introduce students to statistics and pattern recognition techniques for real-time signal classification.

Introduction to Neuromodulation, Jeju National University, Ocean Systems Eng, Autumn 2019

Introduce students to neural signal processing, non-invasive neurostimulation, and design their own brain-computer interface.

SELECTED PUBLICATIONS:

Optimizing computer-brain interface parameters for non-invasive BBI. John LaRocco, Dong-Guk Paeng. *Frontiers in Neuroinformatics* (2020).

A systemic review of available low-cost EEG headsets used for drowsiness detection. John LaRocco, Ming-Dong Le, Dong-Guk Paeng. *Frontiers in Neuroinformatics* (2020).

A functional analysis of two 3D-scanned antique pistols from Victorian New Zealand. John LaRocco, Dong-Guk Paeng. *Virtual Archaeology Review* (2020).

Digital reconstruction of Bernhard Heine’s osteotome. John LaRocco, Volodmyr Komarskyi, and Dong-Guk Paeng. [Preprint]

Spindler: Spatiotemporal adaptive matching pursuit for EEG-based spindle detection. John LaRocco, Piotr Franaszczuk, Scott Kerick, Kay Robbins. *Journal of Neural Engineering* 15(6).

Surgical evaluation of a full-body prosthetic. John LaRocco, Pengwei Li, and Xiaoping Ren. Poster presented at 39th International Annual IEEE Engineering in Biology and Society Conference (2017)

Optimal EEG feature selection from average distance between events and non-events. John LaRocco, Richard D. Jones, Carrie R. H. Innes, Philip J. Bones, Steve Weddell. *Proceedings of the 36th International Annual IEEE Engineering in Biology and Society Conference* (2014)

Simulated testing of a 3D printed revolver cylinder. John LaRocco. *Peer Evaluation* (2013).

PUBLISHED ABSTRACTS:

LaRocco J, Soohong M, Paeng D (Nov 2019). Evaluation of synthetic setae pads for dry attachment of an ultrasound transducer. (Abstract) Proceedings of the IEEE Healthcare Innovations and Point-of-Care Technologies, 2019: 6. [Presented at IEEE HIPOCT 2019], Bethesda, MD, USA, Nov 2019]

LaRocco J, Franaszczuk P, Robbins K (Jan 2017). Comparison of matching pursuit-based methods for EEG-based alpha spindle detection. (Abstract) Proceedings of NYC Neuromodulation Conference, 2017: 23. [Presented at New York City Neuromodulation (NYC Neuromodulation 2017), NYC, Jan 2017]

LaRocco J, Innes C, Bones P, Weddell S, Jones R (Nov 2014). Optimal EEG feature selection from average distances between events and non-events. (Abstract) *Australasian Physical & Engineering Sciences in Medicine*, 38: 195-196. [Presented at New Zealand Physics and Engineering in Medicine Conference (NZPEM 2014), Christchurch, Nov 2014]

PATENTS:

Closed Loop Nanocapsule-based Patient Oxygenation System. John LaRocco, Christian Mayer, Katja Ferenz, Michael Kirsch, and Juergen Linders. [In progress]

Life Support System for a Full Body Prosthetic. TAPR Open Hardware License (www.tapr.org/OHL) Filed (2015).

WORK EXPERIENCE:

Development Engineer, Sound-Eye, Feb 2020-Dec 2020

Designed and implemented an acoustic system for preventative maintenance, and successfully developed a computer-aided auscultation system for identification of respiratory disorders.

Software Engineer, ST Innosparks Innovations, '18-'19

Designed an algorithm for a wearable biometric sensor, and implemented production test procedures.

Machine Learning Researcher, Scientific Innovations, '17

Implemented an automated system for generating feedback on a self-reported lifestyle tracking.

Postdoctoral Researcher, University of Texas San Antonio, '15-'17

Developed a novel, unsupervised EEG-based detection system for fatigue estimation.

Research Assistant, New Zealand Brain Research Institute '12-'15

Implemented a MATLAB-based modular software toolbox for EEG-based microsleep detection.

Note Taker, University of Canterbury Disability Resource Service '15

Recorded and edited lecture notes for disabled and handicapped students.

Teaching Assistant, University of Canterbury Electrical and Computer Eng. Department '15

Provided support and instruction to undergraduate students during tutorial sessions for controls and instrumentation.

Research Assistant, University of Delaware Electrical Eng. Department '11-'12

Investigated the viability of spintronic devices as nanoparticle detectors by measurement of magnetic fields.

Teaching Assistant, University of Delaware Electrical Eng. Department '10-'11

Supervised undergraduate students in electronic circuits lab and graded reports, exams, and homework.

Research Assistant, Rowan University Electrical Eng. Department '08-'09

Developed a battery of tests for exhibiting the effects of meditation training upon brain-computer interface with and without distraction.

Math Tutor, Rowan University Math Department '08-'09

Tutored undergraduate students in topics such as calculus, differential equations, and mathematical proofs.

Biomedical Technician, Kennedy Health Systems '07-'08

Performed periodic maintenance and troubleshooting on medical equipment at three separate medical campuses on a regular schedule.

Overnight Stock, Kohl's Department Stores '05

Prepared merchandise for sale during unconventional hours.

EDUCATION:

University of Texas San Antonio, San Antonio, Texas, USA, Postdoctoral Research, 2015-2017,
Department: Computer Science

University of Canterbury, Christchurch, NZ, PhD, 2012-2015,
Major: Electrical and Computer Engineering

Rowan University, Glassboro, NJ, USA, MS, 2008-2010,
Major: Electrical and Computer Engineering

The College of New Jersey, Ewing, NJ, USA, BS, 2004-2008
Major: Biomedical Engineering

ACCREDITATION/AWARDS:

- Toastmasters International, Level 5 Visionary Communicator Pathway Completion (2020)
- Focused Ultrasound Foundation Fellowship at Jeju National University (2019-2020)
- Postdoctoral Research Fellowship at University of Texas San Antonio (2015-2017)
- IEEE Member (2015)
- Van der Veer Institute Doctoral Scholarship (2012)
- AEL Graduate Honors Society Member (2009-2010)
- Passed EIT Exam (Spring 2008)

SKILLS:

Software: MATLAB, C++, Github, Java, HTML, Arduino, PRO/E, AutoCAD, Solidworks, Mathematica, PSPICE, ANSYS, LabVIEW, EEGLAB, BCI2000

Trade: Writing, CAD/CAM

Writing: Technical, Fiction

TALKS:

- The Kiwicoïn Project*, Seminar, EPIC, Christchurch, NZ, Oct 2014.
- Technical Viability of Artificial Neurocirculatory Systems*, Seminar, NZBRI, Christchurch, NZ, Mar 2013.
- Theoretical Approaches to Connectome Research*, Seminar, NZBRI, Christchurch, NZ, Dec 2012.
- Automated Detection and Classification of Lapses*, Seminar, NZBRI, Christchurch, NZ, Aug 2012.

LEADERSHIP INVOLVEMENT:

- Vice President of Public Relations**, *Bukit Batok Toastmasters Club '20*
- Founder and Manager**, *Ombak Magazine* (www.ombak.org) '18-'20
- 3D Printing Officer**, *UC Maker Society '14-'15*
- Project Director**, *UC Maker Society '13-'14*
- Postgraduate Representative**, *UC ECE '13-'15*
- Secretary**, *One World International Student Club '12-'13*
- Treasurer**, *UD Socratic Club '11-'12*
- Member**, *Biomedical Engineering Society (National) '07-'08*
- Webmaster and Founding Member**, *TCNJ Biomedical Engineering Society '05-'06*
- Newsletter Editor**, *Asian American Association '06-'07*
- Webmaster**, *Korean American Student Association '05-'06*
- Secretary**, *TCNJ Aikido Club '05-06, '06-'07*
- Vice President**, *TCNJ Aikido Club '07-'08*

VOLUNTEER EXPERIENCE:

United States Coast Guard Auxiliary, *Flotilla 054-22-07*, '16-'17
Adopt-a-Shelf Program, *Margaret E. Hegan Public Library*, '08

PUBLISHED FICTION:

Ergo Sum, 2012
Stone Against The Sea, 2013

REFERENCES AVAILABLE UPON REQUEST.