KLAUS OKKELBERG

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OBJECTIVE

Electrical engineer seeking challenging employment opportunities in the Mobile, AL area

EDUCATION

University of New Orleans, New Orleans, LA — 2014
M.S.E. in Electrical Engineering
Thesis topic: Nonlinear filtering for battery state estimation and health management
GPA: 4.0/4.0

The Pennsylvania State University, University Park, PA — 2011
B.S. in Electrical Engineering
Schreyer Honors College Scholar (Representing the top 1% of Penn State students)
Honors thesis topic: Nonlinear control system for nuclear magnetic spectroscopy
GPA: 3.8/4.0

EXPERIENCE

Georgia Tech, Atlanta, GA

Graduate Researcher with Dr. Maysam Ghovanloo — Aug. 2014 – Present

- Studied high-gain adaptive observer for monitoring of battery state of charge and detection of short circuits
- Compared signal and channel estimation methods for CP-OFDM communications
- Analyzed performance of MIMO configurations for LTE-Advanced
- Researched a Multimodal Speech Capture System (MSCS) for speech therapy and accent reduction, consisting of microphones, camera and magnetic sensors for tongue tracking
  - Designed and 3D-printed prototype systems using Solidworks
  - Optimized sensor calibration and magnet localization algorithms (reduced error from >10 mm to 1.8 mm)
  - Extended IPA vowel chart for consonant phoneme analysis
  - Trained deep neural network (DNN) and support vector machines (SVM) for silent speech recognition

Teaching Assistant — Aug. 2015 – Dec. 2016

- Graduate TA for GaTech ECE 3030, Physical Foundations of Computer Engineering (physics of MOSFET operation)
- Graduate TA for GaTech ECE 2031, Digital Design Lab, part of the school's Undergraduate Professional Communication Program (UPCP)
  - Course on programming FPGAs for control of three-wheeled robots
  - Provided writing assistance to all undergraduate students in the Electrical and Computer Engineering department as part of UPCP
- Graduate TA for GaTech Math 4221, Stochastic Processes

Xilinx, Inc., San Jose, CA

Intern — June 2014 – Aug. 2014

- Improved computer mathematical modeling of physical, 16 nm field-programmable gate array (FPGA) devices through Cadence modeling and Matlab/Verilog simulation
  - Increased accuracy of previous model to physical result by 20%
  - Improved simulation speed by a factor of 15
- Developed theoretical model of switching noise magnitude
- Added unattended simulation functionality

Experience (continued)

University of New Orleans, New Orleans, LA

Research Assistant under Dr. Huimin Chen — July 2012 – May 2014

- Studied accuracy and speed of various nonlinear filters as related to estimating battery state of charge
- Researched use of Extended Kalman Filter for highly nonlinear systems through stochastic gradient estimation
- Proposed adjustments to the Unscented Kalman Filter and the Cubature Kalman Filter that increase filtering stability and accuracy
- NASA-funded Masters through Ames Research Center Scholarship

Pennsylvania State University, University Park, PA

Research Assistant under Dr. Jeffrey L. Schiano — Mar. 2010 – May 2011

- Researched a marginal oscillator with a nonlinear feedback element for use in nuclear magnetic spectroscopy
- Studied sampled-data implementation in the presence of thermal noise
- Derived sensitivity of a Robinson marginal oscillator
- Optimized speed of simulation model by a factor of 100

Projects

- GoPro-based underwater fish recognition and tracking using FAST SURF feature matching and dark channel prior transmission map estimation
- Video jitter removal and stabilization using point feature matching and phase correlation
- Image reconstruction from incomplete, quantized measurements using discretized solution of Euler-Lagrange equation
- Estimation of vehicular dynamics through dual nonlinear filtering of vehicle state and operating parameters
- Investigation of resonant tunneling through a double-barrier diode
- Quantum interference visibility in an oscillating macroscopic mirror
- High-speed adaptive decision feedback equalization for SerDes communications

Selected Publications

"Joint Magnetic Calibration and Localization Based on Expectation Maximization for Tongue Tracking," IEEE Transactions on Biomedical Engineering, 2017.

"Comparison of Nonlinear Filtering Methods for Battery State of Charge Estimation," University of New Orleans, 2014.

"Conversion Gain and Sensitivity in Marginal Oscillators: Continuous and Sampled-Data Negative Resistance Converters," The Pennsylvania State University, 2011.

Notes

Software: Matlab, Simulink, PSPICE, Multisim, Mathematica, AutoCAD, Solidworks, Abaqus, GIT, Photoshop, MS Office

Programming: Matlab, Fortran, C/C++, Java, Python, Visual Basic, Perl, Tcl/Tk, LabView, LaTeX

Web Development: Javascript, AJAX, PHP, Python, CSS3, HTML, Apache, MySQL

Leadership: Organized local cycling group, created student running club, president of table tennis club

Volunteering: Habitat for Humanity, Soap Box Derby, Shell Eco-Marathon, Shell Oil/Viva Technology competition mentor for underprivileged students in New Orleans, Bike Around the Bay, Penn State philanthropy for children with cancer (THON), Penn State campus beautification