

Abidin Yildirim, Ph.D.

Curriculum Vitae

Current Positions

- 2020 Associate Professor(P) UAB-Electrical & Computer Engineering
- 2020 Associate Professor(S) UAB-Biomedical Engineering
- 2020 Associate Professor(S) UAB-Department of Education and Curriculum Development

Education

- June 2009 **Ph.D. in Mechanical Engineering**, *Texas Tech University*, Lubbock, TX.
- December 2003 **M.S. in Electrical Engineering**, *The University of Alabama Birmingham*, Birmingham, AL.
- November 1991 **M.S. in Informatics**, *Technische Fachhochschule Berlin*, Berlin, Germany.
- June 1978 **B.S. in Electronics**, *Boğaziçi Üniversitesi*, Istanbul, Turkey.

Awards & Honors

- 2016 Presidents' Diversity Award, University of Alabama at Birmingham.
- 2000 Awards of outstanding accomplishment in organizing the 5th IDPT World Conference, June 2000.
- 1999 Best graduate project design award in annual A&M-Commerce Sigma Xi scientific research society symposium in May 1999.
- 1978 Graduated "Cum Laude", Boğaziçi Üniversitesi, Istanbul-Turkey.

Work Experience

- 2020–Present **Associate Professor**, *UAB, Electrical & Computer Engineering*.
- 2013–2020 **Assistant Professor**, *UAB, Electrical & Computer Engineering*.
- 2013–2019 **Director of Outreach**, *UAB, School of Engineering*.
- 2013–2016 **Co-Director**, *Blazer BEST Robotics*.
- 2003–2013 **Electronics Module Manager**, *UAB-Vision Science Research Center*.
- 1999–2003 **Electronics Specialist**, *UAB-Vision Science Research Center*.
- 2002–2016 **Founder & CEO**, *Smart Engineering, (Sole Proprietorship)*.

- 1999–2000 **Adjunct Professor**, *Department of Computer Sciences*, Troy State University, Montgomery,AL.
- 1999–2000 **Graduate Assistant**, *UAB, Electrical & Computer Engineering*.
- 1998–1999 **Electronics Design Engineer**, *DAL-AIR Casting & Investment Inc.*, Point, TX.
- 1994–1996 **Instructor**, *IB-Internationales Bund*, Berlin, Germany.
- 1985–1994 **Course Developer & Instructor**, *OTA GmbH*, Berlin, Germany.

Teaching Experiences

I Assistant Professor, Electrical & Computer Engineering.

I have taught undergrad and graduate courses and served thesis advisor for graduate student's master thesis. The courses I have taught:

- **EGR 200**, Introduction to Engineering
- **EE 210**, Digital Logic
- **EGR 301**, Honors Research
- **EE 312**, Analysis of Electrical Systems
- **EGR 313**, Bio-instrumentation (Co-Instructor)
- **EE 437/537**, Applications of Embedded Systems
- **EGR 498**, Senior Design I
- **EGR 499**, Senior Design II
- **EGR 602**, Engineering Methods-I
- **EGR 603**, Engineering Methods-II
- **EE 697**, Graduate Project

II Director of Outreach & Experiential Engineering.

As director of outreach, I plan, coordinate, and proceed with various outreach activities for the School of Engineering. Participate and represent the school statewide recruitment events, conferences, and meetings. Between 2003-2005 I was also co-director of "Blazer BEST Robotics" nationwide robotics competition for middle school/ high school kids. Organize, managed, and taught summer camps courses for middle school/ high school kids. An average number of campers per year were 100-120, age of 12-16 years old. Following summer camps are organized and managed and instructed:

Summer Camps:

- **Programming with C#:** Programming with C#,Arduino Sketch. Arduino board is used primary programming platform.
- **Robotics:** Arduino based 4-wheel robot car with IR and Ultrasound sensors. The topics are include:Basics of autonomous cars, obstacle avoidance, line follower, & Bluetooth control.
- **Electronic Circuits:** Using breadboard and standard electronic components to build sensor circuits, such as humidity sensor, light detector, photo sensor, etc.
- **IoT - Internet of Things:** Develop smartphone applications to control (WiFi/Bluetooth) actuators, light bulbs, robot cars, model garage doors.

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- **Biosensors and Applications:** Arduino based BME-instrumentation applications using various sensors. Heart rate monitor, bionic arm, O2/CO2 measurements, body temperature measurements were example projects during the camp.
- **Building and Programming drones:** Build quad-copters and program mission path using open source software applications. Teaching basics of electricity, electric motors, feedback controls, wireless communication, and **FAAA** regulations for the drone piloting for recreational purposes.
- **CAD and 3D Printing:** Using cloud-based **CAD** programs to design 3D objects and print them with 3D Printer.

Community Outreach:

- **Birmingham Public Library-After School Programs:**Programming with C#,Arduino Sketch. Arduino board is used primary programming platform.
- **Coaching "BEST" Robotics:**Arduino based 4-wheel robot car with IR and Ultra-sound sensors. The topics are include:Basics of autonomous cars, obstacle avoidance, line follower, & Bluetooth control.
- **Teaching Programming & Robotics:**Teaching in local community based organizations, K-12 public schools and church schools. Helping them to participate State wide robotics and computer programming competitions.

Publications

- Arie Nakhmani, **Abidin Yildirim**,Dalton Nelson, Veronica Baugh, Calvin Briggs. Interdisciplinary UAB Engineering Camp Report. Unmanned aerial Vehicles. SDPS-Society for Design & Process Technology, 2015, Birmingham, AL.
- Tyler Dickerhoff, **Abidin Yildirim**, Timothy J. Gawne, Roboneuron: "A simple and robust real-time analog spike simulator and calibrator," Journal of Neuroscience Methods, Volume 218, Issue 2, 15 September 2013, Pages 161-163, ISSN 0165-0270, <http://dx.doi.org/10.1016/j.jneumeth.2013.05.010>.
- Walker, H. C., Huang, H., Gonzalez, C. L., Bryant, J. E., Killen, J., Knowlton, R. C.,Montgomery, E. B., Cutter, G. C., **Yildirim, A.**, Guthrie, B. L. and Watts, R. L. (2012), Short latency activation of cortex by clinically effective thalamic brain stimulation for tremor. *Mov. Disord.*, 27: 1404–1412. doi: 10.1002/mds. 25137.
- **Abidin Yildirim**, Zekai Demirezen, Atila Ertas, and Murat M. Tanik, "Application of the Perron Frobenius Theorem in Signal Classification, and Identification," International Journal of Computers, Information, Technology and Engineering (IJCITAE), Volume 5,Number 2, December, 2011, pp. 55-68.

- **Abidin Yildirim**, Murat M. Tanik, and Atila Ertas. "A Survey of Spike Classification Techniques for Neural Prosthesis". SDPS - Society for Design & Process Technology. World Conference - IDPT 2008 - Taichung, Taiwan.
- Stan Gatchel, **Abidin Yildirim**, Emrah Gumus, Faruk Gungor, Levent Caglar., "Use of Complex System Design to Improve Glaucoma Implants". Integrated Design and Process Technology, IDPT 2007. June, 2007.
- Gnadt, J.W., Echols, S.D., **Yildirim, A.**, Honglei Zhang Paul, K., "Spectral cancellation of microstimulation artifact for simultaneous neural recording in situ". IEEE Transactions on Biomedical Engineering, (October 2003, Vol. 50, Number 10. ISSN 0018-9294).
- Amthor, FR, Tootle, JS, **Yildirim, A.**, "A new transparent multi-unit recording array system fabricated by in-house laboratory technology". Journal of Neuroscience Methods. 2003 Jun 30; 126(2):209-19.
- Doganli, A. Ertas, **A. Yildirim**, "A Vibration Monitoring Method using Infrared Diodes," The Seventh World Conference on Integrated Design & Process Technology Conference Proceedings, pp. 855-860, IDPT-2003.
- **A. Yildirim**, M. N. Tanju, K. Abe, M. M. Tanik, and A. Ertas, "An Internet Based Interactive Course on Digital Signal Processing," The Fifth Biennial World Conference on Integrated Design and Process Technology, SDPS (Proceedings in CD), Dallas, Texas, June 4-8, 2000.
- Mahalak, B., **A. Yildirim**, Y. York and M. Loop. (2004) Color enhances brightness, even at threshold. No: 81, p 131. Optometry and Vision Science, (Abstracts).
- York, Y., A. Yildirim, B. Mahalak, and M. Loop. (2004) Are all subjects with red/green deficits insensitive to red light? No: 81, p 132. Optometry and Vision Science, (Abstracts).

Conferences, Panels & Forums

- "Design and Development an Affordable Telemetry System for Navigation of Autonomous vehicle" Poster presentation, Troy State University, 2018, Montgomery, AL.
- 38th Technology Student Association Conference at BJCC. Keynote Speaker, April 25, 2017, Birmingham, AL.
- "Preparing K-12 to College Education " (PPT). 6th Annual SSCET Symposium. Panel speaker and presenter, 2015, New Orleans, LA.

- “STEM Careers Seminar Discussion”, Birmingham Business Alliance and African American Business Council AABC. Panel Speaker at DAXKO Inc., September 15, 2015, Birmingham, AL.
- **ABC33-40**, Local TV broadcasting, “Girls in Engineering - STEM Summer Camp,” June 2015. (<https://www.youtube.com/watch?v=TZQTJML8QYo>).
- “STEM Awareness and Educational Opportunities.” Panel speaker, at Bessemer Public Library, April 2015, Bessemer, AL.
- STEM panel for the 2014 Alpha LEAD Academy for high school boys sponsored by Alpha Phi Alpha Fraternity, Inc. Panel speaker, January 2014, Birmingham, AL.
- “Embedded Microcontroller and applications,” Workshop, presentation at TSUM, 2000. Troy State University at Montgomery, AL.

Committee Chairman - Master Thesis

- Mouhsine Taarji. “Smart Home Automation using Face Recognition for Personalization and Microcontroller for Interfacing with Devices,” 2017.
- Anvesh Loka. “Intraocular Pressure Measurement in Eye by Using Disposable Solid-State Pressure Sensor,” 2017.
- Avinash, Kumar Singh. “Object Detection and Path Detection Systems for Autonomous Terrain Vehicles,” 2017.
- An Liu. “Design and Development an Affordable telemetry System for Navigation of Autonomous vehicle,” 2018.
- Yen-Tze Liu. “Design, Develop and Manufacture a Low-Cost 32-Channel Bio Signal Amplifier and D/A converter Device for Multi-Electrode Neural Recording,” 2019.
- Sahaj Patel. “The Real-Time Extraction of Neural Spikes for Brain-Machine Interface Applications using Deep Learning Algorithm,” 2019.
- Jiayue Wang. “An Assistive Device for Visually Impaired People for the Crosswalk,” 2019.

Ph.D. Committee Member

- Wesley LaBarge, 2020
- Soner Balci, 2016
- Evan Floyd, 2013

Grants-Funded

- STRIDE-Autonomous Vehicles and transportation systems, Department of Transportation, June 2019. \$ 29,223. Role: Co-PI.
- STEM Exploration Training Program for Community College Students, NASA Alabama Space Grant Consortium, 2017. \$ 39,379. Role: Co-PI.
- Pupilometer for Precise Eye Diameter Measurement, Center for Integrated Systems, UAB, 2017. \$ 2,000. Role: Co-PI.
- UAB Driving Companion System for Naturalistic Driving Studies, The Department of Optometry, UAB, 2017. \$ 205,420. Role: Co-PI.
- Developing Community Learning Course for Undergraduate Engineering Students, UAB-Community services and curriculum development, 2016. \$ 2,000. Role: PI.
- Early alert device for child safety and personal safety in vehicles; project consultation and prototype development, private start-up, 2016. \$ 2,000. Role: PI.
- Cognitive Function and Older Drivers with MCI: In-Vehicle Instrumentation in the APPS Study, 2019. \$ 4,287,454. Role: Co-PI.
- SBIR, (1 R43 EY021408-01), \$ 300K. Role: PI.

Grants - Pending

- Senior Capstone Design in Biomedical, 2020. \$ 30,000. Role: Co-PI.
- A Robotic Differential-Resistance Elliptical for Aerobic and Strength Training, 2019. \$ 116,485. Role: Co-PI.

Patents

- Multielectrode array and system for recording and analyzing data from tissue or stimulating tissue. Patent application Nr.:PU00126915500JB
- Protective Helmets for Disasters Situations. Patent application Nr.:PCT/US2015/024240

Synergistic Activities

- 2015–2018 Volunteer course master and instructor for after school Programming and Robotics at Birmingham Public Library.
- June, 2012 Volunteering to SDPS Next Gen. Workshop for H.S. Students in San Antonio, TX, St. Mary's University, SBC Center Building.
- 2008–2018 Volunteering to FOR Nicaraguan Health (www.fornicaraguanhealth.org).
- 2006–2010 Volunteer and member, VOSH-Florida Chapter, Vision and Optometry Services for Humanity.
- 2008–2015 Founding member and Board of Director of Turkish-American Association of Alabama (TAAA, www.alabamaturks.org).

- 2010–2015 Board of Director, Grace Home Foundation (<http://www.gracehomefoundation.org>), USA.
- 2014–2019 Member of Mountain Brook School System Advisory Board
- 2014–2015 Served as Chairperson, Alabama STEM Education Inc., 501(c) non-profit organization for STEM training

Languages

- English
- German
- Turkish, Native
- Spanish, (Intermediate)