Talha Agcayazi - www.talhagca.com

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Summary

⇒ 4 years of **Physical and Physiological Sensor** design
⇒ 3+ years of embedded systems design for **Wearables**
⇒ 4+ years of **Electromechanical Device Characterization**
⇒ Courses in Controls, Machine Learning and MEMS
⇒ Author in more than 15 technical papers
⇒ 3 key internships in industry, government and academia
⇒ 3+ years of **Silicone and Textile** sensor fabrication
⇒ 2+ years of **Flexible Electronics Research for HCI**
⇒ 4+ years of **Multiplexed Capacitive Sensor Design**
⇒ 2 years of collaboration with doctors for **Clinical Testing**
⇒ 5+ years of cross-culture collaboration in research
⇒ Proficient in C, Java, ROS, MATLAB, and Python

Education

North Carolina State University — Raleigh, NC
PhD with MS in Electrical Engineering — *Aug. '15 – May. '20*
Thesis: "Wearable Sensors to Quantify Fit and Comfort for Prosthetic Limb Users"
Advisor: Dr. Alper Bozkurt • GPA: 3.85/4.00

George Mason University — Fairfax, Va
BS in Electrical Engineering + Minor in Computer Science — *Aug. '11 – May. '15*
Capstone Project: "Aiding Search & Rescue Missions with Autonomous UAVs"
Project Advisor: Dr. Gerald Cook • GPA: 3.85/4.00, magna cum laude

Work Experience

Facebook Reality Labs — *Research Intern*
Oculus Research — *May '19 – Sept '19*
⇒ Designed sensors and actuators for the haptic glove project to enhance virtual reality experiences.
⇒ Experience in: **Physical & Physiological Sensing** and **Characterization**

⇒ Results: **1 Patent**, **2 Papers**, **3 Experimental Systems (Electromechanical and Thermomechanical)**

iBionicS Lab, NC State University — *Graduate Research Assistant*
Textile-Based Wearable Pressure and Wetness Sensors — *Aug. '15 – Current*
⇒ Leading the effort to develop capacitance based pressure sensors for prosthetic limb interfaces. Collaborating with College of Textiles, Biomedical Engineering and UNC Medical School.
⇒ Evaluating sensors in clinical subject trials and comparing results against gold standard sensors.
⇒ Developed the data acquisition embedded systems and characterization testbed.
⇒ Fabrication Experience in: Stencil-Screen Printed flexible devices, Silicone Fiber Extrusion and Stitching.
⇒ Experience in: **Physical and Physiological Sensing**, **Characterization**, and **Embedded Systems**

Cyborg Insects for Exploration and Mapping — *Jun. '16 – Jun. '18*
⇒ Developed acoustic and IMU containing electronic interfaces for insects to revolutionize Search and Rescue operations. This project is a collaboration between bio-electronics, robotics and wireless networking.
⇒Experience in: **Analog Design**, **Machine Learning**, **Embedded Systems**, **Networking**, and **Robotics**

Wearable Computer-Assisted Training Systems for Dogs — *Jun. '16 – Aug. '16*
⇒ Analyzed and determined the features necessary to classify between sniffing and panting sounds for dogs using a wearable stethoscope.

⇒ Results: **6 Journal and 12 Conference Papers**, **1 Book Chapter**, **8 Embedded Systems for Data Collection**, and **Numerous programs in Python, C and Matlab**

Laboratory for Autonomous Systems Research, Naval Research Lab — *NREIP Intern*
Visual Navigation in Mobile and Aerial Robotics — *May. '15 – Jul. '15*
⇒ Implemented and tested state of the art Visual Navigation algorithms like PTAM, SVO, AprilTags and external Vicon Tracking to enable autonomous indoor navigation of mobile and aerial robots.

⇒ Results: **1 Technical Report**, **Final Presentation**, and **Programming Experience in ROS and Python**

Robotics Institute, Carnegie Mellon University — *NSF REU Summer Scholar*
BIRD MURI - BIRD Multi-University Research Initiative — *Jun. '14 – Aug. '14*
⇒ Helped develop a monocular vision system for obstacle avoidance in forests.
⇒ Maintained the Linux-Ardupilot system for the project drone and assisted in data collection and testing.

⇒ Results: **1 Conference Paper**, **Final Presentation**, and **Programming Experience in ROS and Python**

Skills

Programming:	Java, Python, C, MATLAB, Lua, Assembly, VHDL and Shell scripting
Characterization:	Instron, MTS, Discovery Rheometer, DMA, ATI Force Sensors, LCR Meter, Oscilloscope, Precision Multimeter, SourceMeter, Laser Microscope
Fabrication:	Stencil Printing, Screen Printing, Oxygen Plasma, Acid Etching, Laser-Cutting, Conductive Doped Silicone, 3D printing, Stitching, Circular Saw, Drill Press
Automated Setups:	Electro-Mechanical, Thermo-Mechanical and Thermo-Electric Characterization
Embedded Systems:	CC2541 (BLE), Simblee (BLE), msp430, RFduino $\Rightarrow$ I2C, SPI, UART, USB, Serial drivers
Tools:	Solidworks, COMSOL, IAR, Eagle CAD, ROS, Contiki, Git, Eclipse and Xilinx ISE
Operating Systems:	Linux (Ubuntu), Windows and Mac

Personal

Leadership & Honors:

$\Rightarrow$ NSF ASSIST Engineering Research Center Industry Liaison – '19
$\Rightarrow$ ECE Department Representative for Graduate Student Association – '19 and '20
$\Rightarrow$ 2nd Place in the 2018 FLEX Conference Poster Competition – '18
$\Rightarrow$ Twice Winner of the NSF GRFP Honorable Mention Award – '16 and '17
$\Rightarrow$ President of the ECE Graduate Student Association, NCSU – '17 and '18
$\Rightarrow$ Vice President of the ECE Graduate Student Association, NCSU – '16
$\Rightarrow$ Outstanding Academic Achievement Award, ECE Department GMU – '15
$\Rightarrow$ Office of Student Scholarship and Research, Student Excellence Award, GMU – '15

Publications: **[Journal$_n$], [Conference Paper$_n$], [Book Chapter$_n$]**

2020 **[J7]** Agcayazi T., McKnight M., Tabor J., Ghosh T., Bozkurt A."*A Scalable Multi-Axis Stress Sensor for Soft Interfaces*", IEEE Sensors 2020. Manuscript in Preparation

[J6] Agcayazi T., Tabor J., McKnight M., Martin I., Ghosh T., Bozkurt A."*Easily to Manufactured, Tunable, Textile-Based Sensors for Pressure and Wetness Sensing*", Advanced Materials Technologies; 2020. Submitted

[J5] McKnight M., Tabor J., Agcayazi T., Ghosh T., Bozkurt A., "*Fully-textile Insole Seam-line for Multi-modal Sensor Mapping*", IEEE Sensors; 2020. Submitted

[J4] Agcayazi T., Menguc Y., Reese S."*Skin in the Game: A Tunable Interface Quality Sensor for Human Coupled Accessories*", IEEE Sensors Letters 2020. Submitted

[C14] Barreiros J., Karakurt I., Agarwal P., Agcayazi T., Reese S., Healy K., Menguc Y. "*Self-sensing Elastomeric Membrane for Haptic Bubble Arrray*", IEEE International Conference on Soft Robotics (RoboSoft); 2020 April 6-9; Cleveland, OH.

2019 **[C13]** Foster M., Agcayazi T., Agcayazi T., Wu T., Gruen M., Roberts D., Bozkurt A. "*Preliminary Evaluation of Dog-Drone Technological Interfaces: Challenges and Opportunities* ", ACM SIGCHI Animal Computer Interaction; 2019 November 12-14; Haifa, Israel.

[J3] Agcayazi T., Foster M., Kausche H., Gordon M., Bozkurt A."*Multi-axis Stress Sensor Characterization and Testing Platform*", HardwareX; 2018.

[J2] Kapoor A., Mcknight M., Chatterjee K., Agcayazi T., Kausche H., Bozkurt A., Ghosh T."*Toward Fully Manufacturable, Fiber Assembly-Based Concurrent Multimodal and Multifunctional Sensors for e-textiles*", Advanced Materials Technologies; 2018.

2018 **[Book Chapter 2]** Mcknight M., Agcayazi T., Ghosh T., Bozkurt A. "*Fiber-Based Sensors: Enabling Next-Generation Ubiquitous Textile Systems*", Wearable Technology in Medicine and Health Care; 2018.

[C12] McKnight M., White C., Agcayazi T., Tabor J., Ghosh T., Bozkurt A., "*Fully Textile, Scalable, Array-Based Wetness Detection for Body-Worn Sensing*", IEEE Biomedical Circuits and Systems Conference (BioCAS); 2018 October 16-20; Cleveland, OH.

[J1] Agcayazi T., Chattarjee K, Ghosh T., Bozkurt A. "*Flexible Interconnects for Electronic Textiles*", Advanced Materials Technologies Invited Review; 2018.

2017 **[C11]** Agcayazi T., Yokus M., Gordon M., Ghosh T., Bozkurt A., "*A Stitched Textile-based Capacitive Respiration Sensor*", IEEE International SENSORS Conference; 2017 October 30 - November 2; Glasgow, UK.

[C10] Agcayazi T., McKnight M., Sotory P., Huang H., Ghosh T., Bozkurt A., "*A Scalable Shear and Normal Force Sensor for Prosthetic Interfaces*", IEEE International SENSORS Conference; 2017 October 30 - November 2; Glasgow, UK.

[C9] Cole J., Agcayazi T., Latif T., Bozkurt A., Lobaton E., "*Speed Estimation based on Gait Analysis for Biobotic Agents*", IEEE International SENSORS Conference; 2017 October 30 - November 2; Glasgow, UK.

[C8] Hong X., Agcayazi T., Latif T., Bozkurt A., Sichitiu M., "*Towards Acoustic Localization for Biobotic Sensor Networks*", IEEE International SENSORS Conference; 2017 October 30 - November 2; Glasgow, UK.

[C7] Yokus M., Hass C., Agcayazi T., Bozkurt A., Daniele M., "*Toward a Wearable Perspiration Sensor*", IEEE International SENSORS Conference; 2017 October 30 - November 2; Glasgow, UK.

2016 **[C6]** Agcayazi T., Hong G., Maione B., Woodard E., "*Wearable Infant Hydration Monitor*", 2016 IEEE Virtual Conference on Applications of Commercial Sensors (VCACS)

[C5] Agcayazi T., McKnight M., Kausche H., Ghosh T., Bozkurt A., "*A Finger Touch Force Detection Method for Textile Based Capacitive Tactile Sensor Arrays*", IEEE International SENSORS Conference; 2016 October 30 - November 2; Orlando, FL.

[C4] Kapoor A., McKnight M., Chatterjee K., Agcayazi T., Kausche H., Ghosh T., Bozkurt A., "*Soft, Flexible 3D Printed Fibers for Capacitive Tactile Sensing*", IEEE International SENSORS Conference; 2016 October 30 - November 2; Orlando, FL.

[C3] McKnight M., Agcayazi T., Kausche H., Ghosh T., Bozkurt A., "*Sensing Textile Seam-line for Wearable Multimodal Physiological Monitoring*", IEEE International IEEE International Conference of Engineering in Medicine and Biology Society (EMBC); 2016 August 16-20; Orlando, FL.

[C2] Brugarolas R., Agcayazi T., Yuschak S., Roberts D., Sherman B., Bozkurt A., "*Towards a Wearable System for Continuous Monitoring of Sniffing and Panting in Dogs*", IEEE International Body Sensor Networks Conference (BSN); 2016 June 14-17; San Francisco, CA.

[C1] Agcayazi T., Cawi E., Jurgenson A., Ghassemi P., Cook G., "*ResQuad: Toward a Semi-Autonomous Wilderness Search and Rescue Unmanned Aerial System*", IEEE International Conference of Unmanned Aircraft Systems (ICUAS); 2016 June 7-10; Arlington, VA.

2015 **[Book Chapter 1]** Dey D., Shankar K., Zeng S., Mehta R., Agcayazi MT., Eriksen C., Daftry S., Martial Hebert, Drew Bagnell, "*Vision and Learning for Deliberative Monocular Cluttered Flight*", Springer Tracts in Advanced Robotics: Results of the 10th International Conference on Field and Service Robotics; 2016 March 16; Volume 113; pp 391 - 409.

[Poster Session] Agcayazi T., Cawi E., Jurgenson A. and Ghassemi P., "*Augmentation of Search and Rescue Operations with Autonomous Aerial Vehicles*", National Conference of Undergraduate Research (NCUR); 2015 April 16-18; Cheney, WA.

[Poster Session] Agcayazi T., Cawi E., Jurgenson A. and Ghassemi P., "*Augmentation of Search and Rescue Operations with Autonomous Aerial Vehicles*", Invited Oral and Poster presenter at the Department and University Symposium, George Mason University

2014 **[Poster Session]** Zeng S., Agcayazi T. and Drew Bagnell., "*Trajectory Following in GPS Denied Environments for UAVs using Receding Horizon Control*", Carnegie Mellon Robotics Institute Summer Scholars Poster Session; 2014 August 7; Pittsburgh, PA.