Daniel Corbett Whittingslow

MISSION STATEMENT

As an orthopaedic surgeon and biomedical engineer, my mission is to bridge the gap between clinical care and cutting-edge biotechnology to improve patient outcomes. By advancing innovative medical technologies, I aim to drive progress in healthcare through scientific research, regulatory oversight, and the development of transformative solutions in musculoskeletal health.

EDUCATION

Orthopaedic Residency **June 2022 - Present**
University of North Carolina, Chapel HIll, NC
Selected as the research resident, Clinical training in musculoskeletal health, trauma, and complex surgical procedures.

Medical Degree **Jul 2013–May 2022**
Emory University School of Medicine, Atlanta, GA

PhD Biomedical Engineering **Aug 2016-Dec 2019**
Georgia Institute of Technology, Atlanta, Georgia
Thesis: "*Anatomy of a Joint Sound – Using Joint Acoustic Emissions to Diagnose and Grade Musculoskeletal Disease and Injury."*
Adviser: Omer Inan, PhD

B.S. Biomedical Engineering **Aug 2009-May 2013**
Georgia Institute of Technology, Atlanta, Georgia
Graduated *summa cum la*ude with a Biomedical Engineering degree with a minor in Spanish.

PROFESSIONAL EXPERIENCE

Orthopaedic Surgeon **June 2022 – Present**
University of North Carolina, Chapel Hill, NC
Leading clinical care for musculoskeletal diseases, trauma management, and complex surgeries.
Collaboration with multidisciplinary teams to improve patient outcomes and refine surgical techniques.

Co-Founder, Chief Medical Officer **2019 – Present**
Arthroba
Co-founded a company focused on developing wearable technologies for joint health using vibroacoustic biomarkers to monitor musculoskeletal diseases like osteoarthritis.
Spearheading product development, clinical validation, and regulatory strategy to bring non-invasive, real-time diagnostics to market.
Developed partnerships with leading healthcare providers for clinical trials and product deployment.

Co-Founder, Chief Medical Officer **2021 – Present**
Techeeta
Led the development of wearable sensors for monitoring elite athlete performance and health. Integrated biotechnology with clinical applications to provide real-time feedback for sports medicine, improving performance monitoring and injury prevention.
Directed the clinical trial strategy and regulatory efforts to ensure compliance with industry standards.

Co-Founder **2013 – 2017**

Vertera Spine

Developed IP on manufacturing process of semi-porous PEEK material for orthopedic applications, transforming spinal fusion surgery with improved osseointegration and mechanical strength. Led product commercialization and regulatory approval, resulting in the device being acquired by Nuvasive, impacting patient care worldwide. At time of acquisition had been implanted in >100,000 patients.

Doctoral Researcher **2016 – 2020**

Georgia Institute of Technology

Led research on joint acoustical emissions as a non-invasive biomarker for musculoskeletal health, including knee osteoarthritis and juvenile idiopathic arthritis. Developed methodologies for quantifying joint sounds, advancing diagnostic techniques for early disease detection. Resulted in multiple patents, publications, and a PhD.

PUBLICATIONS (Chronological)

1. Acoustic Emissions as a Non-invasive Biomarker of the Structural Health of the Knee. **DC Whittingslow**, HK Jeong, VG Ganti, NJ Kirkpatrick, GF Kogler, OI Inan - Annals of Biomedical Engineering, 2020.
2. **Whittingslow D**, Lara Orlandic, Talia Gergely, Sampath Prahalad, Omer Inan, Shelly Abramowicz. *Listening to the Jaw: TMJ Acoustic Emissions as a Digital Biomarker of Juvenile Idiopathic Arthritis.* Journal of Oral and Maxillofacial Surgery, 2020.
3. Robust Method for Mid-Activity Tracking and Evaluation of Ankle Health Post-Injury. S Mabrouk, **D Whittingslow**, O Inan - IEEE Transactions on Biomedical Engineering, 2020
4. A Pilot Study to Assess the Reliability of Sensing Joint Acoustic Emissions of the Wrist. DM Hochman, S Gharehbaghi, **D Whittingslow**, OI Inan - Sensors, 2020
5. Mabrouk S, Hersek S, Jeong HK, **Whittingslow D**, Ganti VG, Wolkoff P, Inan OT. *Robust Longitudinal Ankle Edema Assessment Using Wearable Bioimpedance Spectroscopy*. IEEE Trans Biomed Eng: 1, 2019.
6. Nicholas B. Bolus, Hyeon Ki Jeong, **Daniel C. Whittingslow**, O T Inan. *A Glove-Based Form Factor for Collecting Joint Acoustical Emissions: Design and Validation*. IEEE Sensors. 2019
7. H. K. Jeong, **D. Whittingslow** and O. T. Inan, "*b-Value: A Potential Biomarker for Assessing Knee-Joint Health Using Acoustical Emission Sensing*," in IEEE Sensors Letters, vol. 2, no. 4, pp. 1-4, Dec. 2018, Art no. 7001204.doi: 10.1109/LSENS.2018.2871981
8. B. Semiz*, S. Hersek*, **D. C. Whittingslow***, L. Ponder, S. Prahalad and O. T. Inan, "*Using Knee Acoustical Emissions for Sensing Joint Health in Patients with Juvenile Idiopathic Arthritis: A Pilot Study*," in IEEE Sensors Journal.doi: 10.1109/JSEN.2018.2869990
9. O. Bicen, **D. Whittingslow** and O. Inan, "*Template-Based Statistical Modeling and Synthesis for Noise Analysis of Ballistocardiogram Signals: A Cycle-Averaged Approach*," in IEEE Journal of Biomedical and Health Informatics.doi: 10.1109/JBHI.2018.2871141
10. Jeong, H.-K., Pouyan, M. B., **Whittingslow, D. C.,** Ganti, V., & Inan, O. T. (2018). *Quantifying the Effects of Increasing Mechanical Stress on Knee Acoustical Emissions Using Unsupervised Graph Mining*. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 26(3), 594-601.
11. **Whittingslow, D.,** Semiz, B., Ponders, L., Wiens, A., Inan, O., & Prahalad, S. (2017). *Analysis and Implications of Non-Invasive Knee Acoustical Emissions in Juvenile Idiopathic Arthritis*. Arthritis & Rheumatology.
12. **Whittingslow, D.,** Semiz, B., Ponder, L., Vega-Fernandez, P., Inan, O., & Prahalad, S.

(2017). *Knee Joint Sounds: A Non-Invasive Modality for Classifying Knee Joint Health in Juvenile Idiopathic Arthritis*. Paper presented at the ARTHRITIS & RHEUMATOLOGY.

13. Inan, O. T., **Whittingslow, D. C.,** Teague, C. N., Hersek, S., Pouyan, M. B., Millard-Stafford, M., Sawka, M. N. (2017). *Wearable knee health system employing novel physiological biomarkers. Journal of Applied Physiology*, 124(3), 537-547.
14. Evans, N. T., Torstrick, F. B., Lee, C. S., Dupont, K. M., Safranski, D. L., Chang, W. A., **Whittingslow, D. C. ,** Gall, K. (2015). *High-strength, surface-porous polyether-ether-ketone for load-bearing orthopedic implants*. Acta biomaterialia, 13, 159-167.
15. Evans, N., Torstrick, F., Lee, C., Dupont, K., Safranski, D., Chang, W., ... **Whittingslow, D.,** Gall, K. (2015). *Surface porous PEEK with high strength for load-bearing orthopaedic implants*. Paper presented at the Abstracts of Papers of the American Chemical Society.
16. **Whittingslow, D.,** Evans, N., Carson, R., & Gall, K. (2012). *A Study on the Development and Characterization of PEEK for Improved Osseointegration*. Abstract presented at the Biomedical Engineering Society (BMES) Annual Meeting.

CONFERENCE PRESENTATIONS

1. **Daniel C. Whittingslow**, O T Inan, John Xerogeanes. *Joint-Associated Sounds: Translation to Orthopaedic Patients*. Oral presentation at the Quarterly Emory Orthopaedics Sports Research Meeting, Atlanta, GA.
2. **Daniel C. Whittingslow**, Sevda Gharehbaghi, Hyeon-Ki Jeong, Nick Bolus, Talia Gergely, Lori Ponders, Omer T Inan, Sampath Prahalad. *Acoustic Emission Based Assessment of the Knee in Juvenile Idiopathic Arthritis*. Poster presentation at the 2019 Annual Pediatric Research Conference, Atlanta, GA.
3. **Daniel C. Whittingslow**, Lara Orlandic, Talia Gergely, Lori Ponders, Sampath Prahalad, Omer T. Inan, Shelly Abramowicz. *Assessment of the TMJ in Juvenile Idiopathic Arthritis Using Acoustic Emissions Generated from Jaw Movements in Two Planes*. Poster presentation at the Childhoood Arthritis and Rheumatology Research Alliance (CARRA) 2019 Annual Meeting, Louisville, KY.
4. **Daniel C. Whittingslow**, Lara Orlandic, Talia Gergely, Lori Ponders, Sampath Prahalad, Omer T. Inan, Shelly Abramowicz. *Acoustic Emission Based Assessment of Temporomandibular Joints*. Oral Presentation at the American Academy of Craniomaxillofacial Surgeons (AACMFS) 2019 Annual Meeting, San Antonio, TX.
5. B. Semiz, S. Hersek, **D. Whittingslow**, L. Ponder, S. Prahalad, and O.T. Inan, *Change Point Detection in Knee Acoustic Emissions using the Teager Operator: A Preliminary Study in Patients with Juvenile Idiopathic Arthritis*. IEEE Biomedical and Health Informatics Conference (BHI), Chicago, IL, 2019
6. **D.C. Whittingslow**, H.K. Jeong, L Orlandic, T Gergely, L Ponders, O.T. Inan, S Prahalad, S Abramowicz. "*Acoustic Emissions Generated by the TMJ of Patients with JIA and their Implication on Assessment and Screening*". At ACR/ARHP. Chicago, Il. 2018.

INVITED LECTURES

- Whittingslow, D.C. 'Reimagining Technology to Solve Real World Problems'. Pediatric Rheumatology of the South (PRoS) Meeting Fall 2019 - Hosted by the Emory University School of Medicine and Children's Healthcare of Atlanta. See the Presentation Slides Here.
- Whittingslow, D.C. 'Reimagining Technology to Solve Real World Problems'. 2019. AMSC Health Tech Event 2019. Hosted by the Morehouse School of Medicine at Atlanta Metropolitan State College.
- Whittingslow, D.C. *'How to Get into Med School and Other Tips from an MD/PhD Student*'. 2018. Georgia Institute of Technology – GT 1000 Class Lecture.
- Whittingslow, D.C. *'Introduction to Mathematical Modeling in the Context of Biomedical Analysis of Concussions*'. 2016. Georgia Institute of Technology – Class Lecture.
- Whittingslow, D.C. '*Tips for Being a Successful Medical School Applicant'. 2014.* Student Hospital Connection Group at Georgia Tech.

PATENTS

Multi-Modal system for tracking respiratory health – “Covid Patch” – EP4211533A4 and WO2022056214A1

A Glove-Based Form Factor for Bio-acoustical Sensing – Patent US US20210137458A1

Semi-porous PEEK for Orthopedic Applications manufacturing synthesis process. Patent US 9085665 B1 reflects assignment to Vertera, Inc.

NOTABLE EXPERIENCES:

Academic & Research Leadership

- **Telemedicine-Enabled Heel Height Detection Program** (June 2020)
  Developed an innovative telemedicine program to remotely assess heel height discrepancies in **ACL patients** using **computer vision**. This initiative significantly improved patient care and enabled continuous monitoring during the COVID-19 pandemic.
- **Post-Doctoral Researcher, Inan Research Lab** (Jan 2020 – June 2020)
  Led research on **joint acoustical emissions** as a non-invasive diagnostic tool for musculoskeletal diseases, mentoring lab members and advancing understanding of vibroacoustic biomarkers in clinical applications.
- **Graduate Research Assistant, Inan Research Lab** (Feb 2016 – Dec 2019)
  Conducted pioneering work on **minimally invasive diagnostic technologies** for musculoskeletal health. Created and validated a **cadaveric model** for joint acoustical emissions, contributing to the field of non-invasive diagnostics.
- **Team Leader, Introduction to Health Informatics** (July 2016 – Dec 2019)
  Led a team of computer science students to design a mobile app for aggregating and analyzing clinical data, improving decision-making in healthcare settings.
- **Graduate Research Assistant, Willett Research Lab** (Dec 2015 – Feb 2016)
  Developed a **mouse model of distal tibia fracture**, gaining expertise in **micro-CT imaging** and **3D reconstruction** for musculoskeletal research.
- **Graduate Research Assistant, Hammond Research Lab** (Nov 2015 – Dec 2015)
  Designed a **soft pressure sensor** for prosthetic hands, applying **soft robotics** and **rapid prototyping** techniques to enhance patient care.

Leadership & Mentorship

- **President, Biomedical Engineering Honor Society**, Georgia Tech (Feb 2012 – May 2013)
  Led Georgia Tech’s chapter of the **National Biomedical Engineering Honor Society**, overseeing academic and professional development programs for members.
- **MD/PhD Student Advisory Board Treasurer** (July 2017 – July 2018)
  Managed the budget for a group of 70 students and faculty, organized academic events, and contributed to community-building efforts within the academic program.

Global & Community Health Contributions

- **Engineering World Health Program Coordinator** (Jan 2010 – May 2012)
  Led projects to rebuild medical devices for hospitals in low-resource areas, improving healthcare delivery and providing experience in **global health challenges**.
- **Surgical Team Assistant/Translator, Amigos Por Cristo** (May 2011)
  Assisted in performing over 50 surgeries in **Nicaragua**, supporting a surgical team and

translating between patients and medical staff.
- **La Feria de Salud Volunteer** (Oct 2014)
  Provided **health services** to the underserved Hispanic community in Atlanta, focusing on **disease prevention** and **health education**.

Technical & Extracurricular Involvement

- **Website Developer** (Jan 2018 – Present)
  Designed and maintained websites for **clinical** and **research labs**, applying **digital tools** to improve healthcare communication and research accessibility.
- **Georgia Tech Senior Design Judge** (July 2016 – Present)
  Volunteered as a judge for the **Senior Design Expo**, assessing innovative engineering solutions for healthcare applications and providing feedback on **medical device concepts**.

SKILLS

- **Clinical Expertise:** Advanced knowledge and experience in musculoskeletal health, trauma management, image interpretation (MRI, CT, EKG, XR), orthopaedic surgery, and patient care.
- **Regulatory Affairs & Policy Development:** Expertise in navigating medical device regulations, clinical trial oversight, and compliance with FDA and other regulatory bodies. Experience with **regulatory approval processes** and **medical device commercialization**.
- **Biomedical Engineering & Innovation:** Proficient in product development, medical device design, and the application of **biotechnology** in healthcare. Co-founded and led companies developing **wearable health technologies and orthopaedic spinal implants.**.
- **Clinical Trial Design & Research:** Extensive experience in designing and conducting **clinical trials**, evaluating clinical evidence, and using **clinical outcome assessments**. Led research in **joint acoustical emissions** as biomarkers for musculoskeletal diseases.
- **Cross-Disciplinary Collaboration:** Proven ability to work effectively in multidisciplinary teams, including physicians, engineers, and regulatory professionals, to develop and refine healthcare solutions.
- **Data Analysis & Signal Processing:** Strong background in signal processing, data analytics, and biomechanics for healthcare applications, including MATLAB, Python, and LabView.
- **Leadership & Entrepreneurship:** Demonstrated leadership in co-founding and managing biotechnology companies, from product development to regulatory approval and market launch.
- **Communication & Presentation:** Skilled in presenting complex medical and technical information to diverse audiences, including regulatory bodies, clinical teams, and executive leadership.
- **Anatomical and Dissection Expertise:** Experience with human cadaver dissections and a strong understanding of human anatomy.
- **Imaging Interpretation:** Ability to read and interpret multiple imaging modalities, including MRI, CT, EKG, and X-ray.

- **Micro-CT & Material Testing:** Proficient in performing micro-CT scans and conducting mechanical testing (UTS, fatigue, bending, etc.).
- **Mathematical & Physical Modeling:** Expertise in mathematical modeling and physical simulations for biomedical applications.
- **3D Modeling & Prototyping:** Proficient in SolidWorks for 3D modeling, rapid prototyping, and product fabrication using technologies such as laser cutting, lathe, and CNC.
- **Circuit Design & Microprocessors:** Experienced in circuit design, microprocessor utilization, and the development of bioelectronic systems.
- **Soft Robotics & Silicone Casting:** Proficient in soft robotics design and silicone casting techniques for healthcare applications.
- **Language & Certifications:** Fluency in Spanish, and certified in CPR/ACLS Healthcare Provider.

RECOGNITIONS AND AWARDS

Dean's List (all semesters), Faculty Honors (Fall '09, Summer '11), Recipient of the Ty Cobb Educational foundation scholarship, the Georgia Tech IMPACT scholarship, the Georgia Tech Campoamor Scholarship, James "Rhio" O'Connor Scholarship essay contest winner