

## **Wearable Technology for Joint Health Assessment (#7000)**

*A set of sensing modalities for providing an in-depth assessment of knee health*

Georgia Tech researchers have developed a set of sensing modalities for providing an in-depth assessment of knee health. These modalities include the sounds and swelling of the joint; parameters which can only be measured currently in clinical settings and typically in a qualitative manner. The wearable system quantifies features from these modalities in software, and has demonstrated sensitive bio-markers of knee's healing progress. By objectively quantifying the knee health frequently during the rehabilitation progress, decisions regarding the treatment program can be made on a continual basis with therapies adjusted based on the changing needs of the patient. This allows for a more efficient determination of whether physical therapy is sufficient, and an important return-to-play assessment for athletes.

### **Benefits/Advantages**

- Sensitive bio-markers of knee healing process
- Can be used outside of clinical settings
- Provides quantitative measurements as opposed to qualitative ones

### **Potential Commercial Applications**

- Create a new class of knee braces, sleeves, and wraps that can sense the health of the joint dynamically
- Provide informed decision aids to the user and caregiver alike regarding rehabilitation progress

### **Background/Context for This Invention**

Knees are among the most commonly injured body parts, and account for the most severe injuries for athletes and sedentary populations alike. Current tools for diagnosing knee injuries are expensive, inconvenient for the patient, and limited to clinical settings. After the injury is diagnosed and a treatment plan generated, the rehabilitation progress is not well tracked and often involves infrequent visits to the physical therapist for adjustments. There is a need for a wearable device patients can utilize from home to track knee health.

**Dr. Omer T. Inan**

Assistant Professor - Georgia Tech School of Electrical and Computer Engineering

**Dr. Geza Frank Kogler**

Research Scientist II – Georgia Tech College of Sciences Biological Sciences

**Dr. Jennifer Olson Hasler**

Professor - Georgia Tech School of Electrical and Computer Engineering

**Michael Sawka**

Professor - Georgia Tech College of Sciences

**Mindy Millard-Stafford**

Professor - Georgia Tech School of Biological Sciences

**Hakan Toreyin**

Research Assistant - Georgia Tech School of Electrical and Computer Engineering

**Sinan Hersek**

Graduate Research Assistant - Georgia Tech School of Electrical and Computer Engineering

**Caitlin Teague**

PhD candidate - Georgia Tech School of Electrical and Computer Engineering

**More Information**

**Publications**

[\*GEEKOUT: Cracking Bats and Bones: Inside Sports Medicine with Omer Inan\*](#)

---

[\*A Wearable, Multimodal Sensing System to Monitor Knee Joint Health\*](#), IEEE Sensors Journal, May 14, 2020

---

**For more information about this technology, please visit:**

<https://licensing.research.gatech.edu/technology/wearable-technology-joint-health-assessment>

Images: