Diseases Prediction & Treatment

"To contribute to human welfare by bringing innovative ideas to commercial clinical products that save human lives."

**Neuro-modulation**

There are a lot of nerves in the human body, and these nerves transmit information using electrical signals. By modulating nerves, many diseases can be treated. Various neuro-modulation systems which can safely correct various neural signals are being developed.

**Body & Stress control**

Body discomforts of severe or constant stress reflect parents quality of life poorly. Arm rehabilitation and posture adjustment using soft actuators and stimulators can improve these discomforts. Research of deepening stress (well using bio-signals in everyday life) can help stress control for better quality of life as well.

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- **Diabetes**
  - Artificial blood glucose control system is being studied for convenient diabetes management. Our goal is to control blood glucose using artificial intelligence and control algorithms with non-invasive continuous glucose monitoring. All of these work comprehensively as a single artificial pancreas system.

- **Cardiovascular**
  - Cardiovascular disease is the leading global cause of death. Managing BP is important to reduce the risk of the cardiovascular disease. More effective and efficient ways to monitor and modulate the BP are being researched.

**Neurological disorder treatment system**

- Detection
- Closed-loop neuromodulation

**Hypertension treatment system**

- Stimulation
- Electroactive polymer (EAP) textile actuator

**Electroactive polymer**

- Has low weight, low active voltage, and flexible mechanical properties. Textile structure can reinforce the mechanical property of the actuator and improve output power.

**Body & Stress control**

- Electroactive polymer has light weight, low active voltage and flexible mechanical property. Textile structure can reinforce the mechanical property of the actuator and improve output power. Our goal is developing the rehabilitation device using textile artificial muscle to rehabilitate arm or joint for after stroke and arthritis patients.

**Control sympathetic nervous system (SNS) to decrease blood pressure**

- SNS plays a key role in hypertension. We tried to damage sympathetic nerves which located around the outer wall of renal (kidney). To do this, we set three goals. 1. Damage all renal nerves 360 degrees 2. Protect renal artery and minimize thermal damage to the arterial lumen. 3. Do not damage other tissue during surgery.

**AI-based stress monitoring system**

- To appropriately treat stress, it is important to automatically detect stress and to provide a personalized intervention. With deep learning approaches, we develop automatic stress detection model. Furthermore, we plan to design an innovative service to provide a stress management system for employees.

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**Innovative Medical Solution Laboratory**

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