

# Picoleaf™

Symptoms like numbness, pain, tingling sensation, or loss of sensation in your feet and hands could be early signs of Peripheral Neuropathy, a condition caused by nerve damage due to Type 2 diabetes. For years, detecting Peripheral Neuropathy in its early stages has been a challenge as it can be asymptotic, leaving many patients unaware of the risks they face. Murata and Aarca Research has embarked on the journey of developing a solution using the Picoleaf™ kit to detect the early symptoms of Peripheral Neuropathy.



- Picoleaf™ is a flexible and thin sensor capable of highly sensitive pressing force detection, developed using Murata Manufacturing's proprietary piezoelectric technology. It can be mounted on smaller spaces, is thinner than conventional sensors. Piezoelectric film sensors are highly sensitive and can be used as a sensor for detecting bio signals such as "pulsation and respiration."

## Solution Design

Observed pulse interval (pulse duration) is longer in leg for people with diabetes than normal people. Whereas it is uniform for normal people across ROIs. The quality of signal and the expected pattern is of good quality in normal people than diabetic people, i.e. the signal is getting distorted for diabetic subjects. This observation is consistent with chest and legs ROI across people.

### Solution Objectives

1 **First of its kind device to detect "Peripheral Neuropathy"**

2 **In early clinical study**

## Possible Applications/Use Cases



**Medical/  
Healthcare**

- Piezoelectricity – the charge created in sensor when pressure is applied
- Suitable for measuring dynamic pressure exerted by blood on vessel walls
- Picoleaf™ – used to calculate pulse pressure waveform at different parts of body
- Features can be extracted from pulse pressure signal to depict blood flow (\*Simple features such as average area under each pulse can explain the nature of blood flow.)

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