



MASTER PROJECT

Directional Microphone based on an Artificial Spider Web



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Voice control is everywhere these days, but to hear people effectively from every direction, devices like Amazon's Echo need to have a whole collection of microphones in them – but they take up space, require extra processing power and restrict industrial design. It has recently been shown that nano-dimensional

spider silk captures fluctuating airflow with maximum physical efficiency from 1 Hz to 50 kHz combined with high directionality [1]. In contrast to common microphones which detect pressure variations, a spider-silk is sensing air flow.

The goal of this project is to microfabricate and test

artificial spider silk made from nano-electro-mechanical silicon nitride structures for the next generation directional microphones.

[1] J. Zhou and R. N. Miles, *Proc. Natl. Acad. Sci.* **114** (2017), pp. 12120-12125.