Abstract Submitted
for the 4CS20 Meeting of
The American Physical Society

Machine Learning Utilization for Temperature Predictions from Photoluminescence Properties of CdTe Quantum Dots[1] MARISSA IRACA, Lock Haven University, BYU REU 2020 TEAM —

Minute temperature changes in biological systems can result in the unraveling of DNA sequences or cause mutations. When studying these biological samples within a microfluidic device, a sensor that can detect these minute changes in temperature is necessary. A sensitive temperature detector was developed by training a neural network with spectral and time-resolved photoluminescence data. This data was recorded with corresponding temperature from a cadmium telluride quantum dot sample that emitted at around 808nm. The photoluminescence data was used as an input and the corresponding temperature was used as an output when training the neural network. Using the trained neural network, temperature predictions within a mean absolute error of 0.599 K were achieved.

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Date submitted: 25 Sep 2020   Electronic form version 1.4