

Abstract Submitted
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Neural Network Temperature Predictions based on the Optical Properties of Quantum Dots¹ EMMA MCCLURE, DEREK SANCHEZ, Brigham Young University, JORDAN BRYAN, Illinois State University, MARISSA IRACA, Lock Haven University, JAMES ERIKSON, CHARLES LEWIS, TROY MUNRO, JOHN COLTON, Brigham Young University — Cadmium telluride quantum dots, as well as other types of quantum dots, have potential applications as localized temperature sensors in microfluidic devices due to the temperature-dependent qualities of their photoluminescence (PL) lifetime lengths. To take advantage of these properties, PL spectral data and time-resolved PL data of various samples were collected at a range of temperatures, and a machine learning algorithm was trained to output a temperature prediction based on the input data. Two different cadmium telluride quantum dot samples have been tested already and show promising results, with a mean absolute error (MAE) as low as 0.1 K for those emitting PL at 620 nanometers. More samples, such as perovskite quantum dots will be investigated in the future.

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