Using Machine Learning for Estimating Level of Thermal Energy Storage Using Image Processing

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The aim of the project is to predict the fraction of total amount of thermal energy storage in a platform using Phase Change Materials (PCM), such as waxes and salt-hydrates. Images were obtained using Infra-Red (I.R.) Camera for the qualitative temperature profile of a cylinder filled with PCM at different melt-fractions. For each IR image, the melt-fraction was determined independently using a GoPro camera. These IR images will be used along with the corresponding tag (melt-fraction) for training using Neural Networks (NN) configurations. The NN algorithm will be optimized to minimize the errors (e.g., MAPE) by changing the number of nodes. The NN will then be used to predict the values of melt-fraction for a separate set of IR images obtained from experiments (testing and validation). The IR image used for testing and validation will be different from the IR images used for training the NN algorithms.