Optimal Control of Wave Energy Converters

In this presentation, I will address the control of the wave energy conversion device for maximizing the energy converted from the ocean wave.

The Singular Arc control, which is derived from the optimal control theory, is implemented for the Wave Energy Converter. Since the wave information is required by the controller, the Extended Kalman Filter is implemented for the wave estimation.

The measurements used by the estimator are collected from the sensors on the hull of the Wave Energy Converter. Numerical simulations are conducted on a heaving point absorber Wave Energy Converter. The results show that the proposed estimator has a good estimation of the excitation force. Hence, with the correct knowledge of the excitation force, the developed controller has a good performance in terms of the energy production.

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