

Optimal and predictive control in the upstream oil and gas industry

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Abstract: We review the applications of optimal control and model predictive control for the upstream oil and gas industry. The applications range from closed-loop reservoir management aimed at maximizing the recovered net present value of an oil reservoir over its lifetime to continuous planning, scheduling and control of process equipment such as pipelines, compressors, risers and separators. We compare model predictive control and optimization in the upstream oil and gas industry to the more mature industrial practice of model predictive control in combination with real-time optimization and even economic model predictive control in downstream chemical, petrochemical, oil refining and energy producing industries. Economic model predictive control is identified as a key enabling technology for increasing profitable production, reducing cost, and automatizing offshore oil and gas production.

Keywords: Oil and Gas, Optimal Control, Model Predictive Control, Automatic Control

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