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Costly Sequential Experimentation and Project Valuation with an Application to Health Technology Assessment

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Abstract

We study the optimal investment/abandonment decision for a project, where costly sequential experimentation provides information about its true profitability. We derive the optimal decision rule by appropriately extending the Bayesian framework of sequential hypothesis testing. The optimal decision time takes the form of the first exit time of a particular inaction region. We find that increased noise in the observations lowers the value of the project, and that the effect on the expected time at which a decision is taken is ambiguous. Delays in observations affect both project value and the inaction region. The model is illustrated with a health technology assessment application using data on standard versus robot-assisted laporascopic prostatectomy.

Keywords: Sequential experimentation, Optimal stopping, Health technology assessment

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