

# MONOTONIC SUCCESSIVE APPROXIMATIONS IN QUEUEING SYSTEMS

**H. Blok**, Leiden University, The Netherlands, blok1@math.leidenuniv.nl

**S. Bhulai**, VU University Amsterdam, The Netherlands, s.bhulai@vu.nl

**F.M. Spieksma**, Leiden University, The Netherlands, spieksma@math.leidenuniv.nl

In many queueing models with arrival or departure control it can be shown that a policy with a switching curve is optimal. Nonetheless, it can still be difficult to compute the switching curve and thus the optimal policy. In this presentation we propose a fast method for approximating such a curve in the following way. Suppose the queueing model can be modelled as a Markov decision process for which successive approximation converges. Often the iteration step has a monotonic property in the sense that the switching curve either increases or decreases in the iteration step of the successive approximation scheme, depending on the initialisation. As the number of iterations grows, this provides an increasingly tighter bound on the set of potentially optimal curves. We will discuss the method and provide several applications.