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Robust approachability and regret minimization in games with partial monitoring

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(Submitted on 25 May 2011 (v1), last revised 15 Feb 2012 (this version, v3))

Approachability has become a standard tool in analyzing earning algorithms in the adversarial online learning setup. We develop a variant of approachability for games where there is ambiguity in the obtained reward that belongs to a set, rather than being a single vector. Using this variant we tackle the problem of approachability in games with partial monitoring and develop simple and efficient algorithms (i.e., with constant per-step complexity) for this setup. We finally consider external regret and internal regret in repeated games with partial monitoring and derive regret-minimizing strategies based on approachability theory.

Subjects: Statistics Theory (math.ST); Learning (cs.LG) Cite as: arXiv:1105.4995 [math.ST] (or arXiv:1105.4995v3 [math.ST] for this version)

Submission history

From: Gilles Stoltz [view email] [v1] Wed, 25 May 2011 11:19:05 GMT (28kb) [v2] Tue, 30 Aug 2011 06:15:04 GMT (28kb) [v3] Wed, 15 Feb 2012 14:38:47 GMT (63kb)

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