

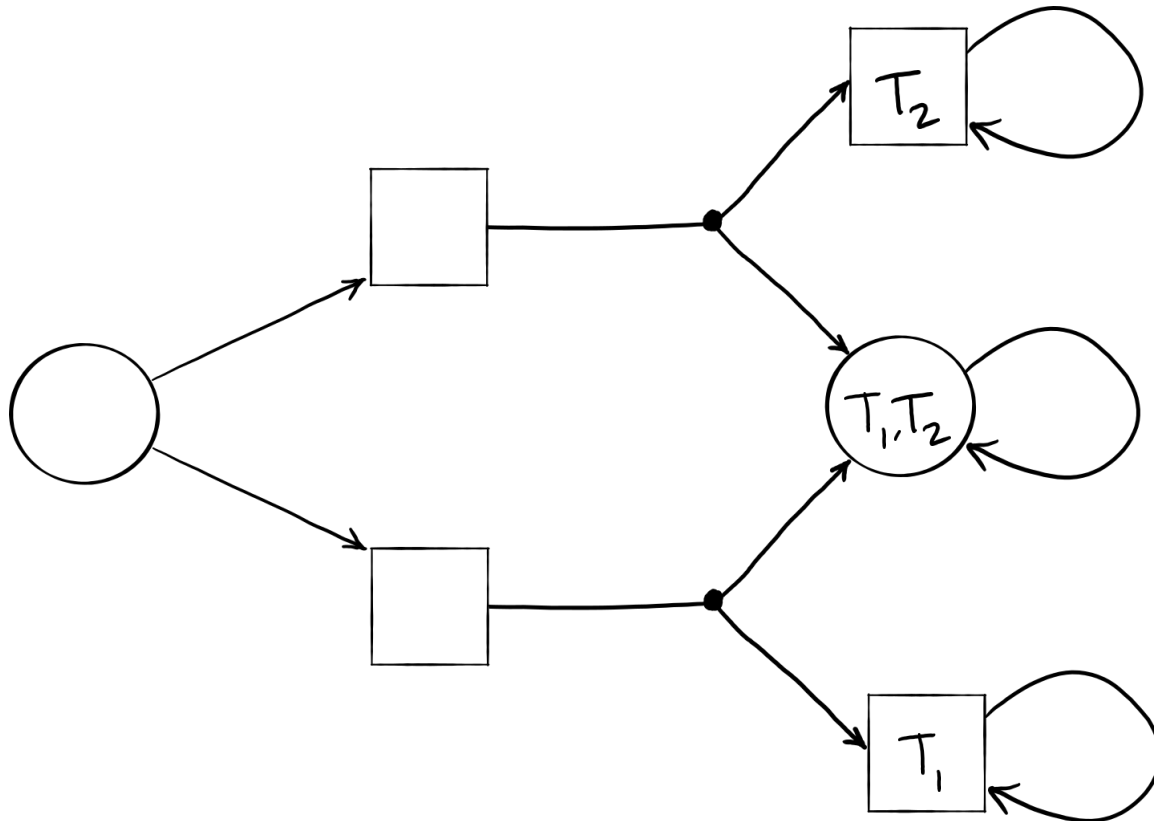
Approximating Values of Generalized-Reachability Stochastic Games

Maximilian Weininger

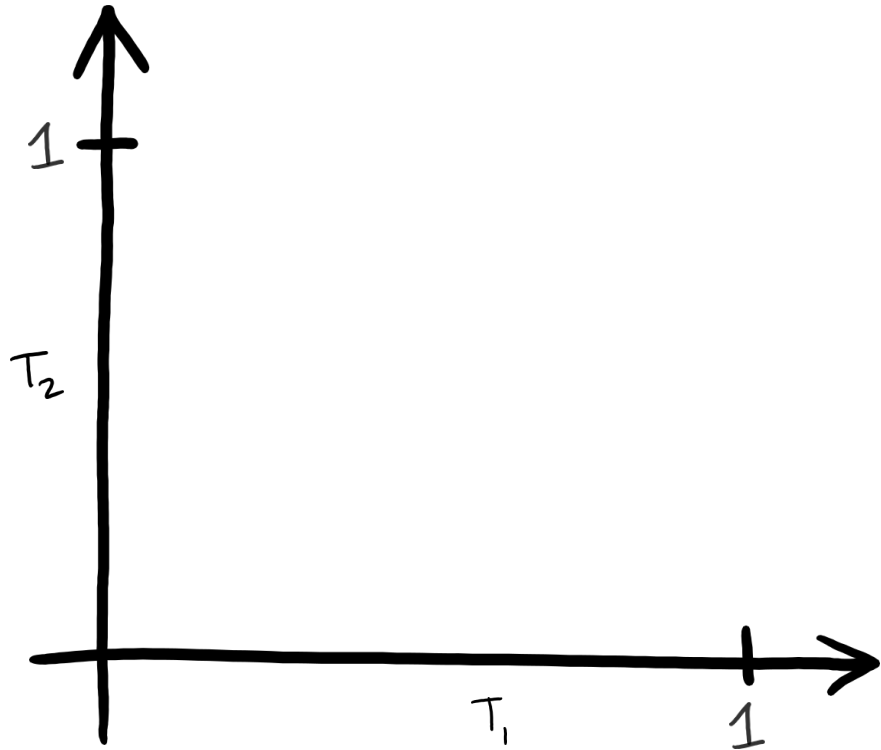
joint work with Pranav Ashok, Krishnendu Chatterjee, Jan Kretínský, Tobias Winkler

HIGHLIGHTS 2020
(Paper appeared at LICS 2020)

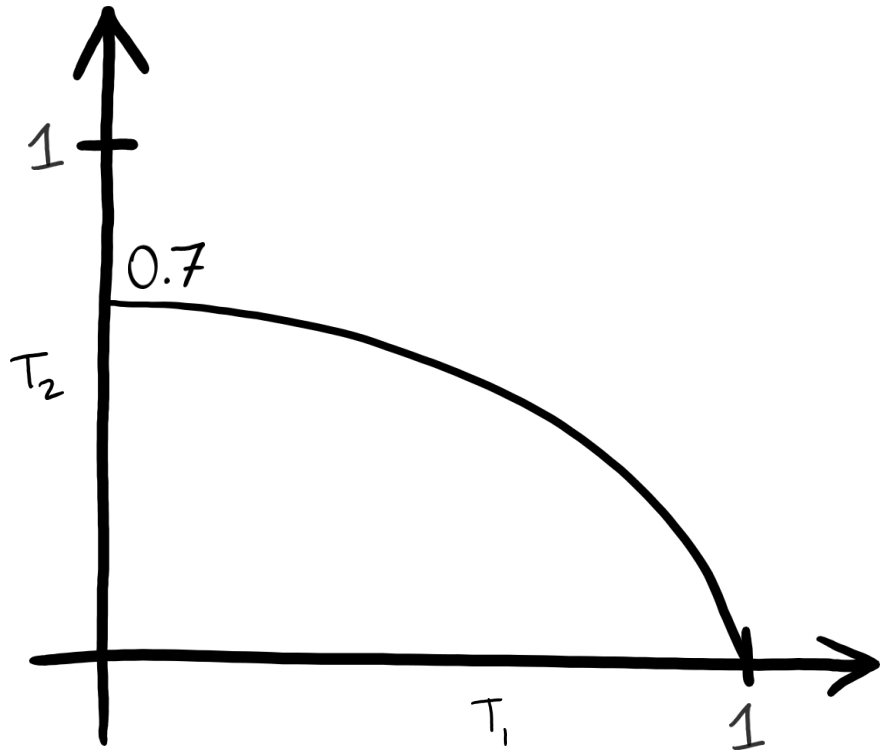
Model



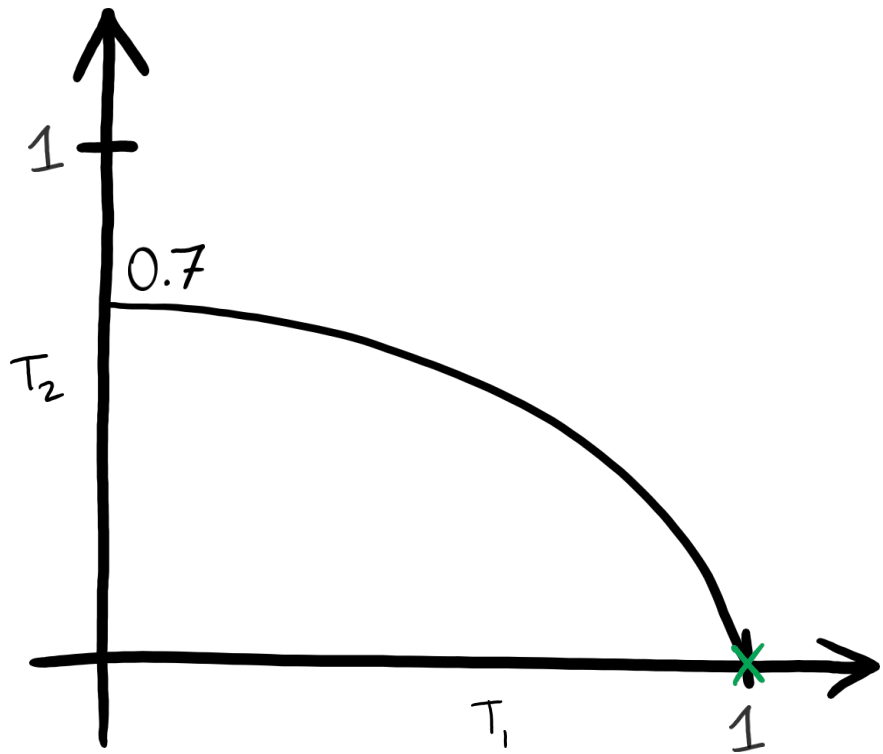
The problem



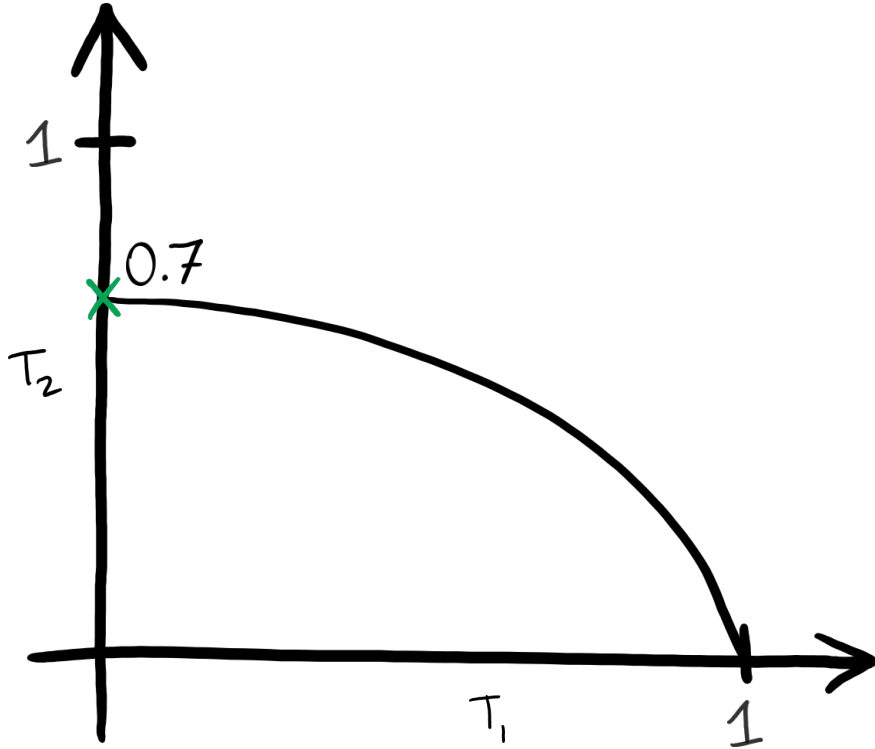
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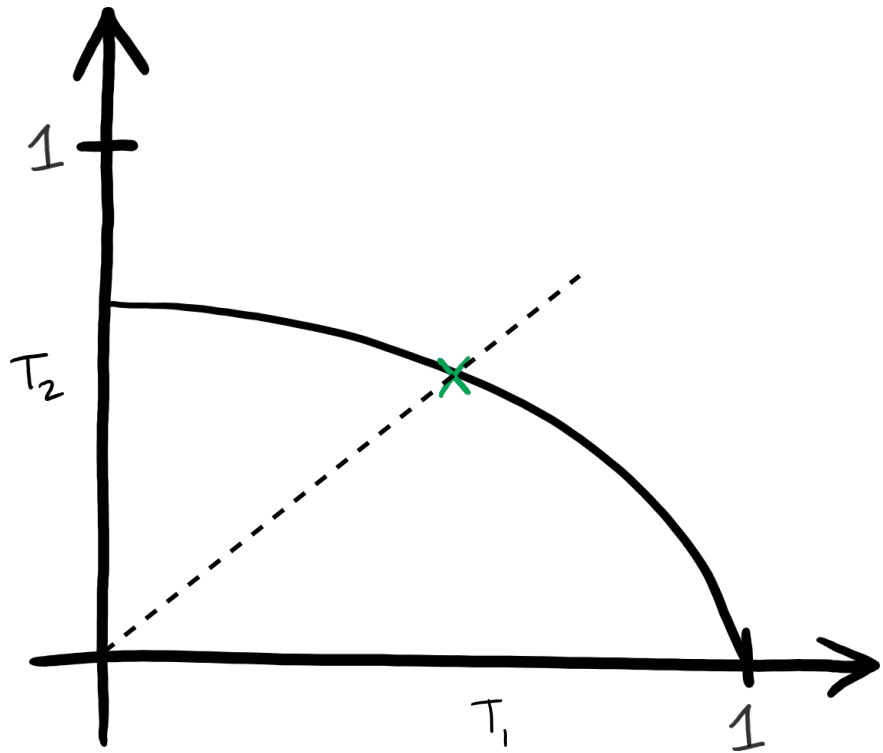
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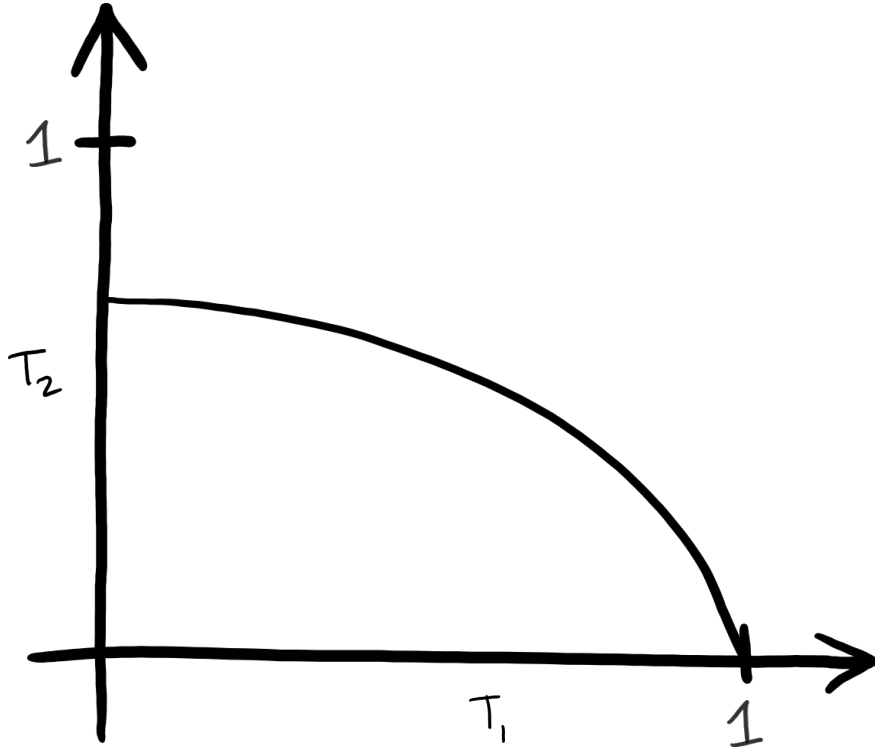
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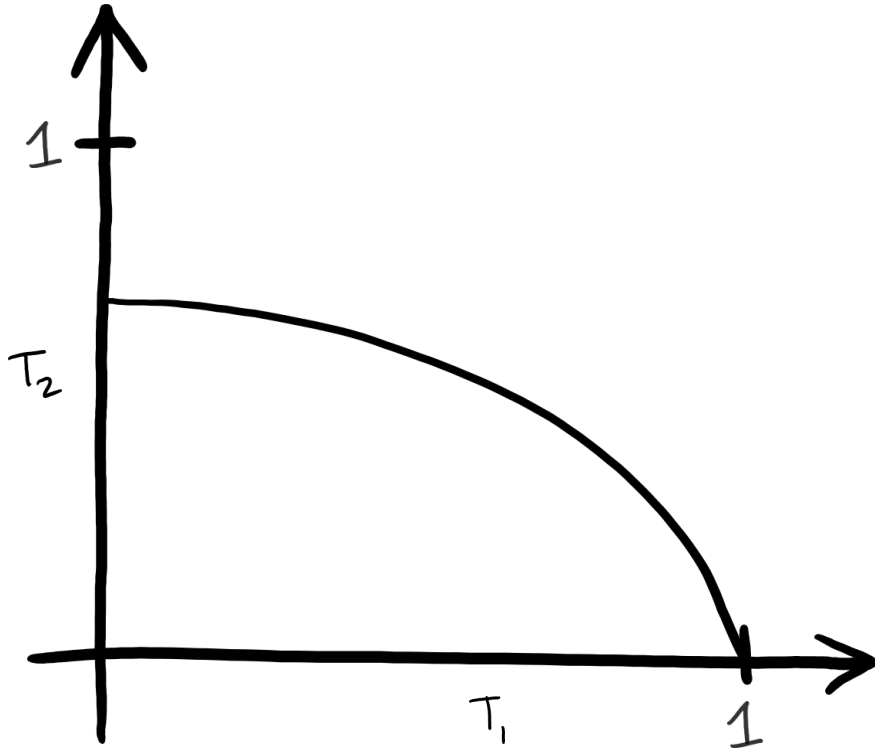


The problem



Want: Pareto frontier

The problem

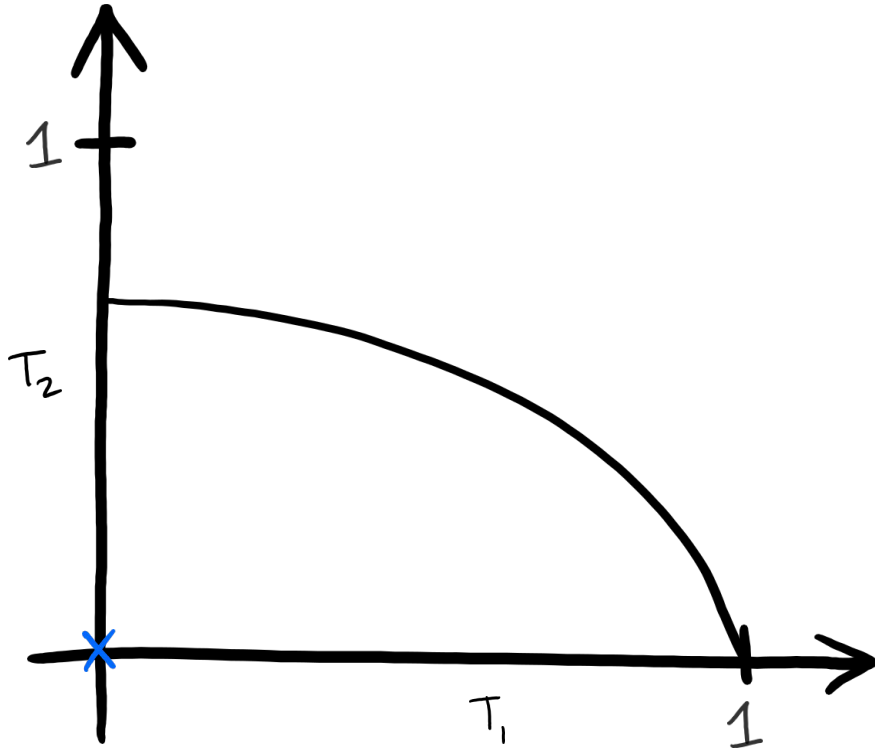


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How: Value iteration from below [CFK+13]

[CFK+13] Chen, T., Forejt, V., Kwiatkowska, M., Simaitis, A., & Wiltsche, C. On stochastic games with multiple objectives. MFCS 2013.

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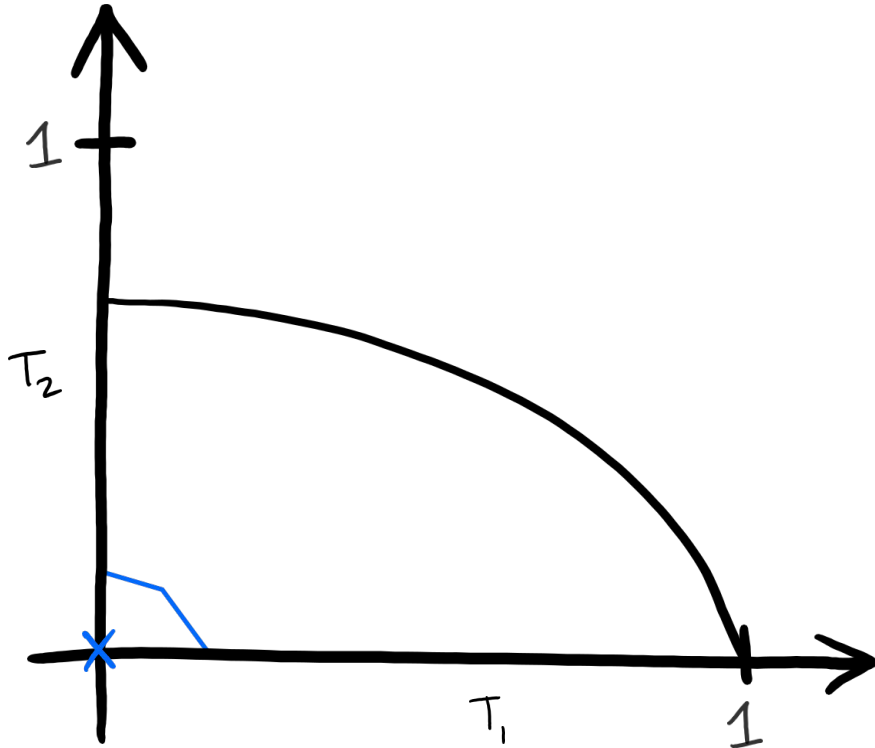


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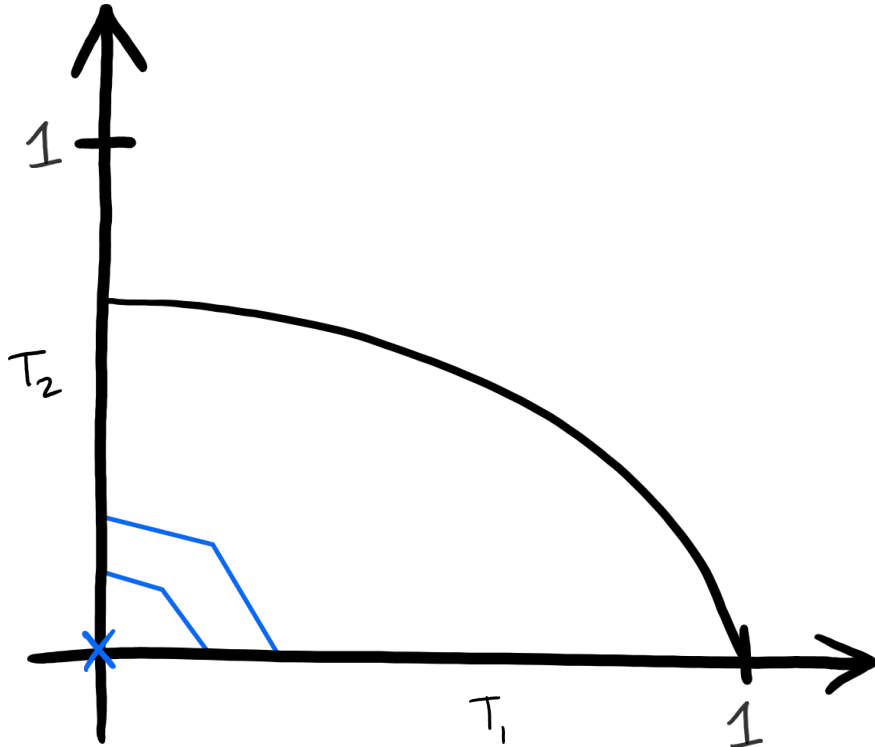


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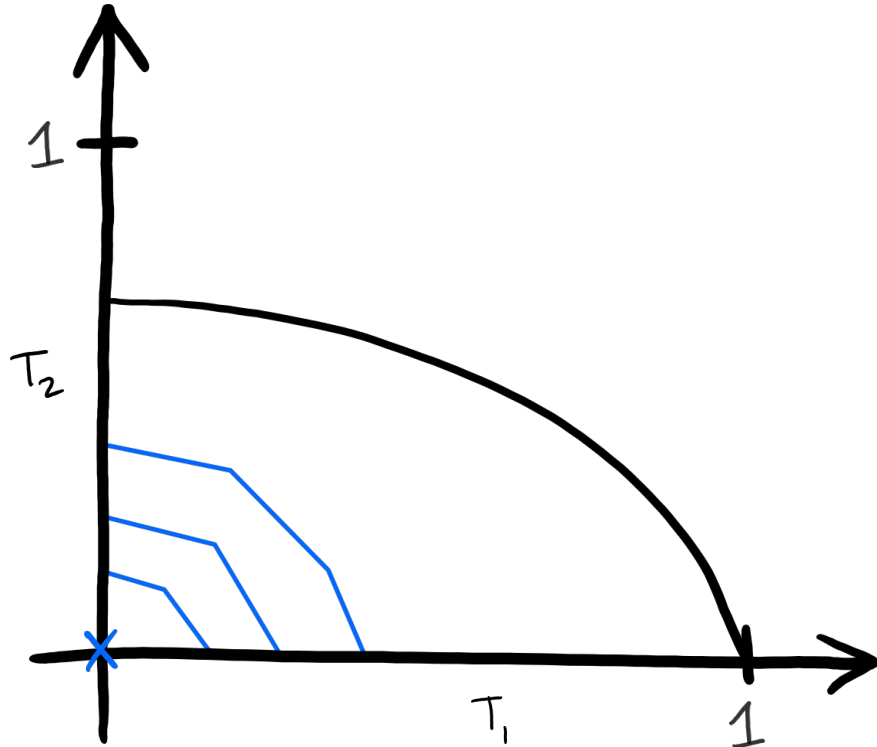


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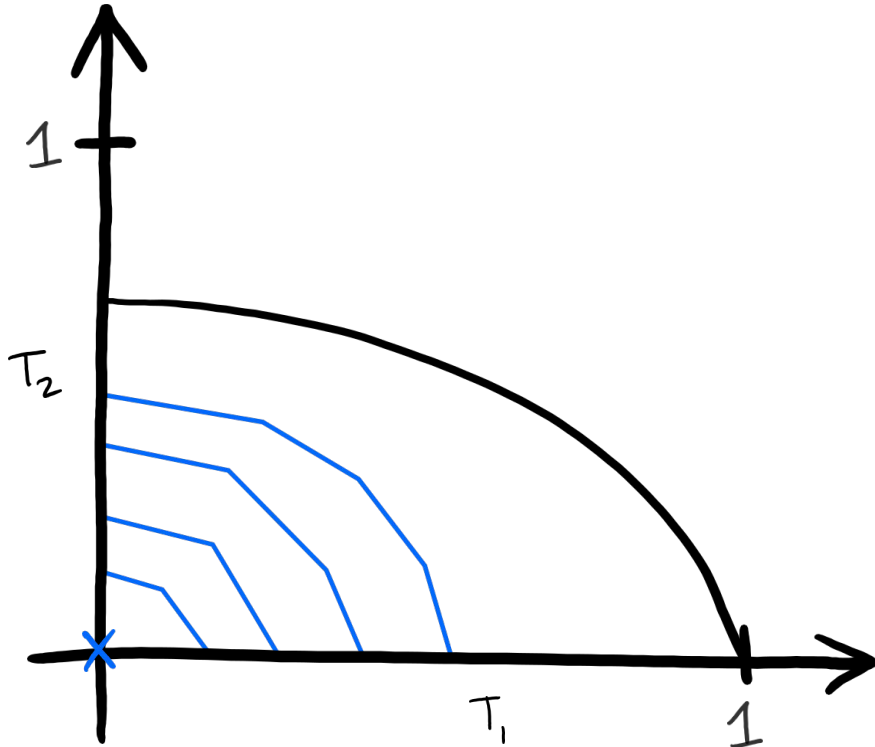


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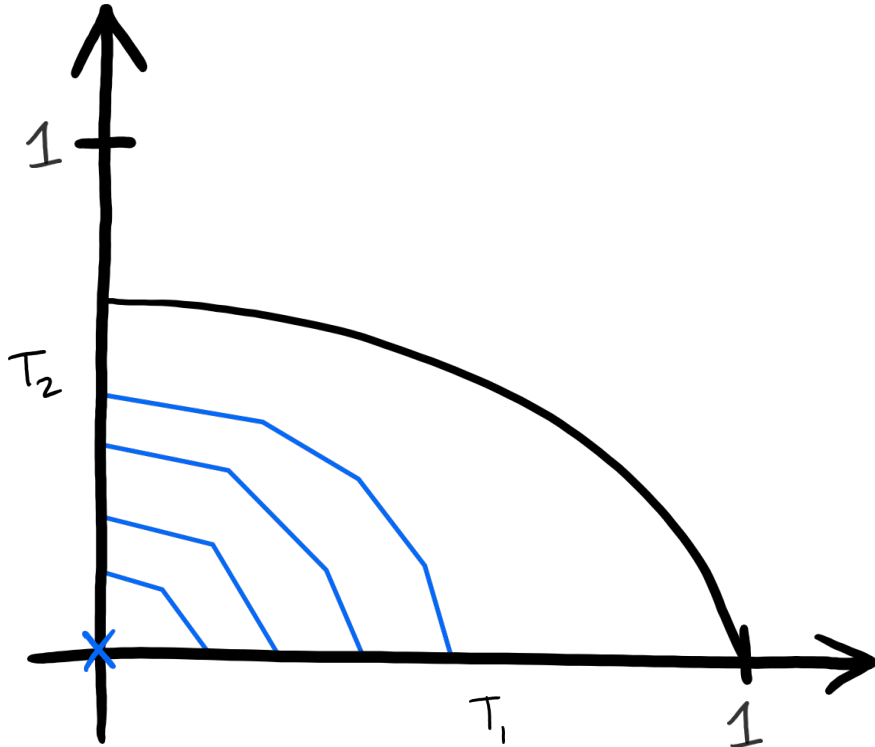


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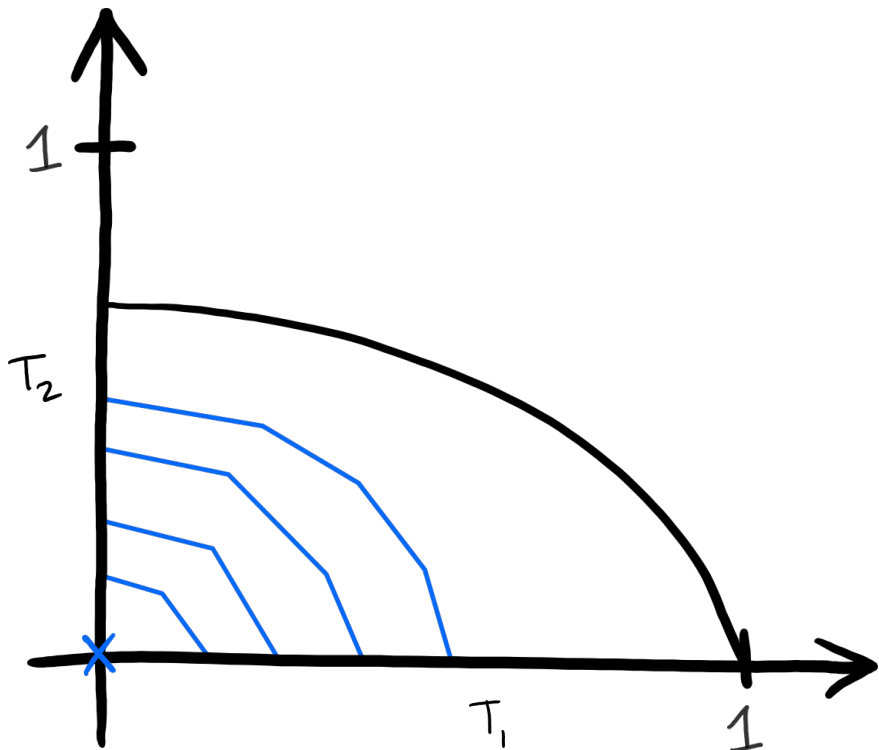
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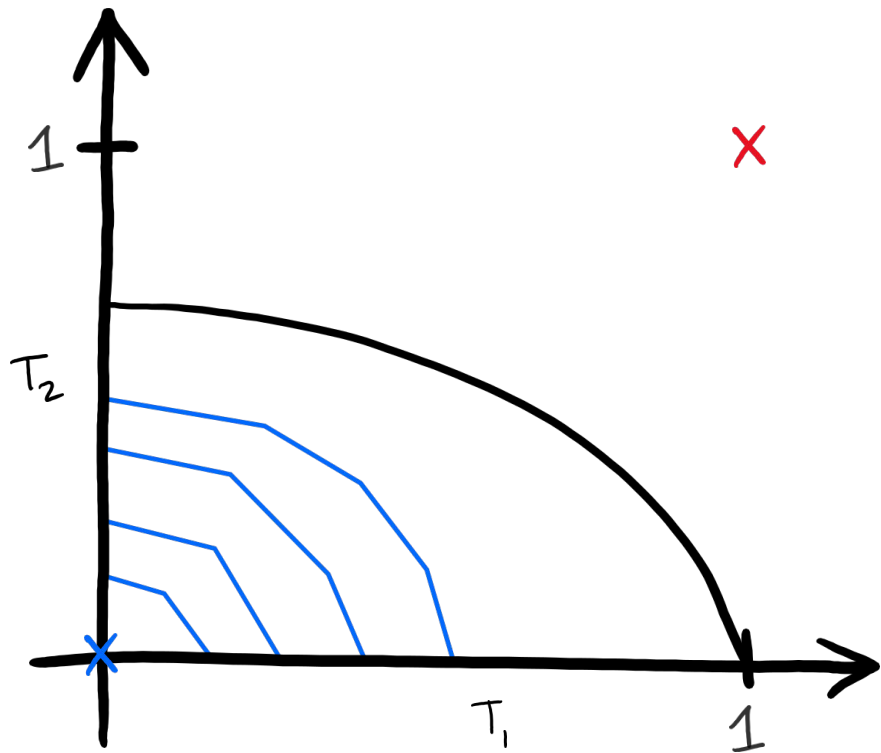
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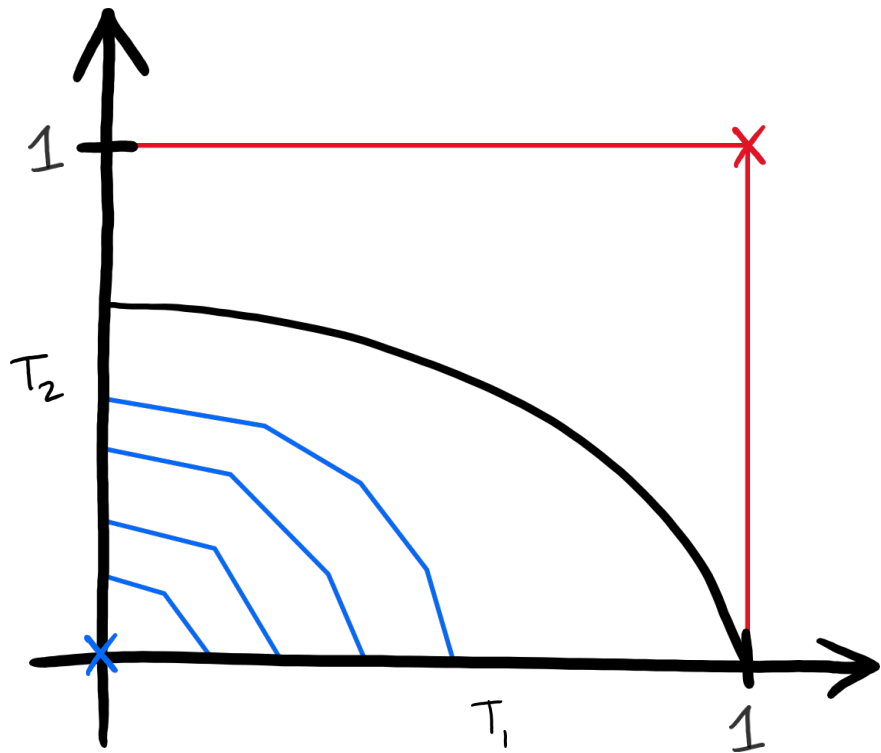
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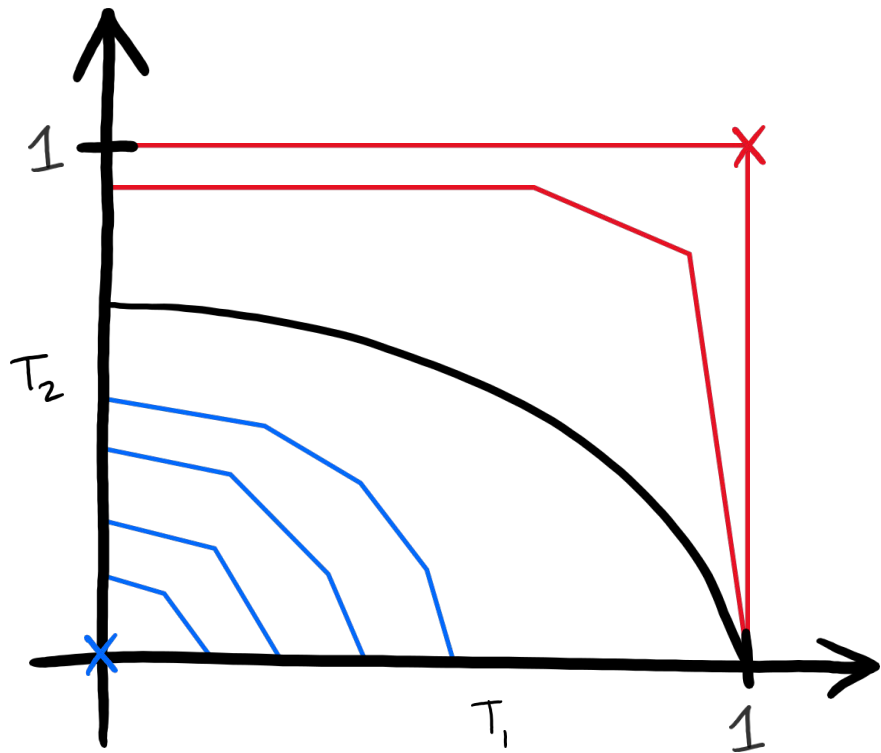
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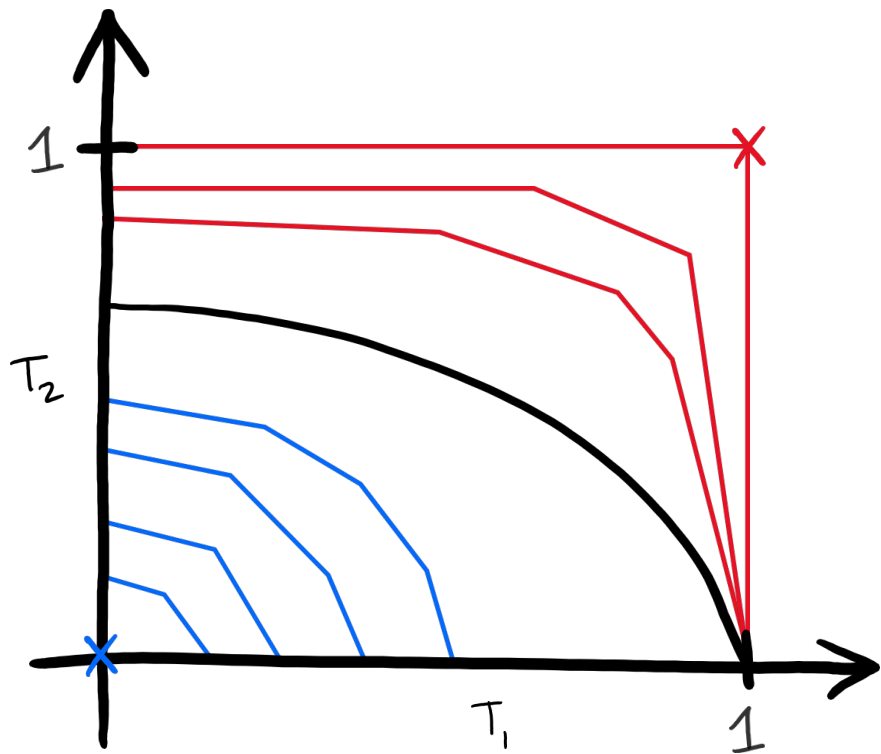
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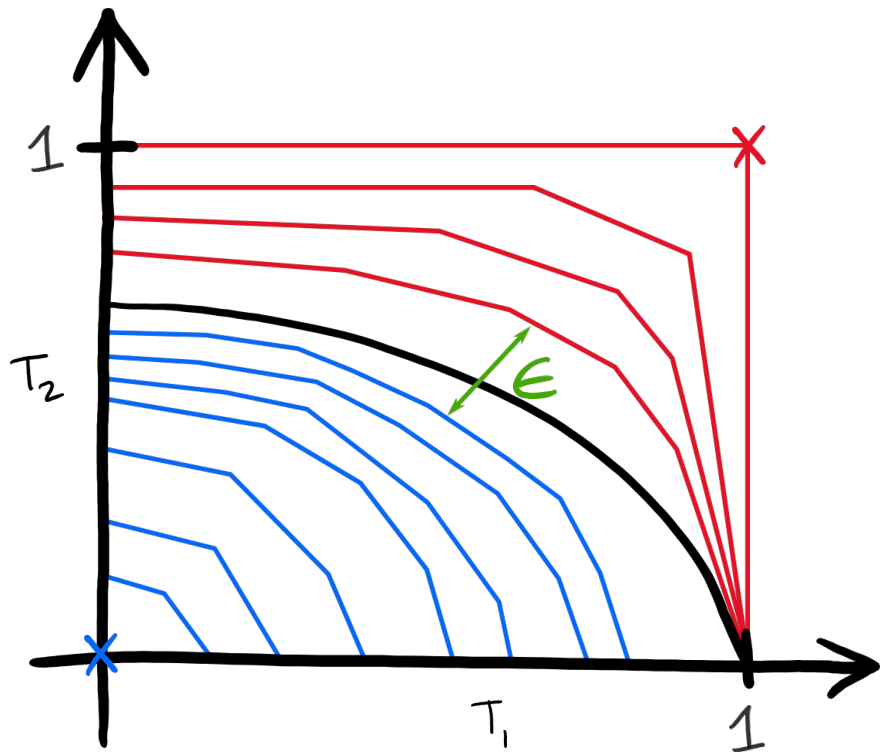
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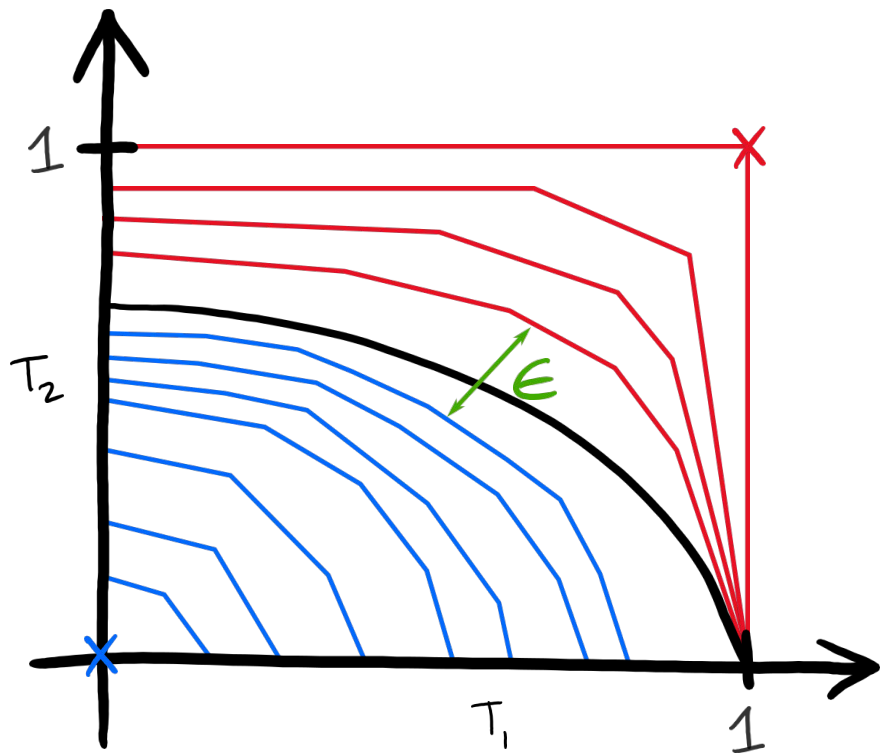
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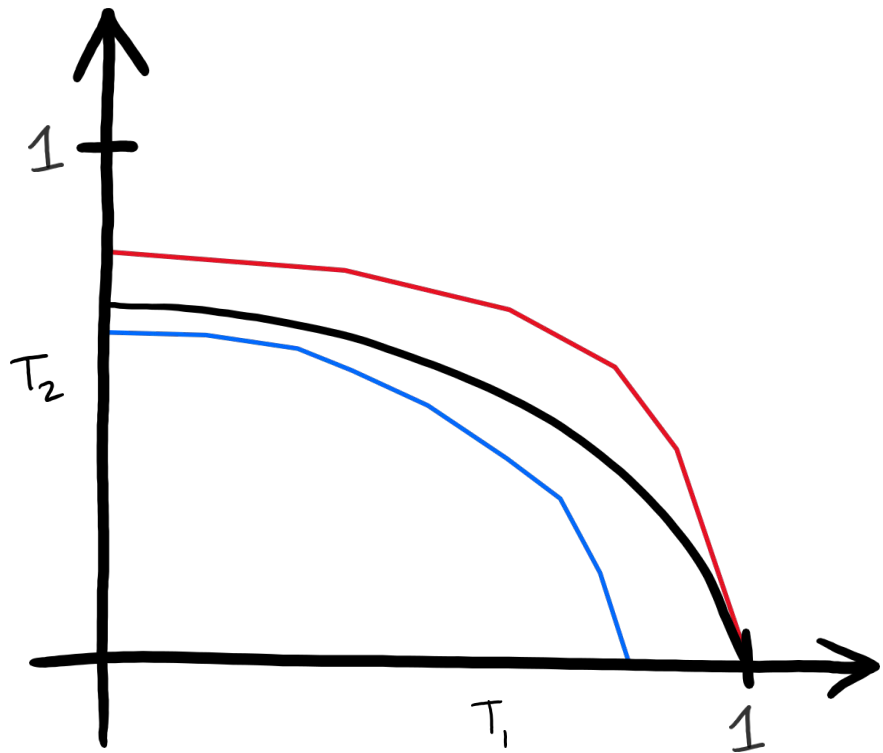
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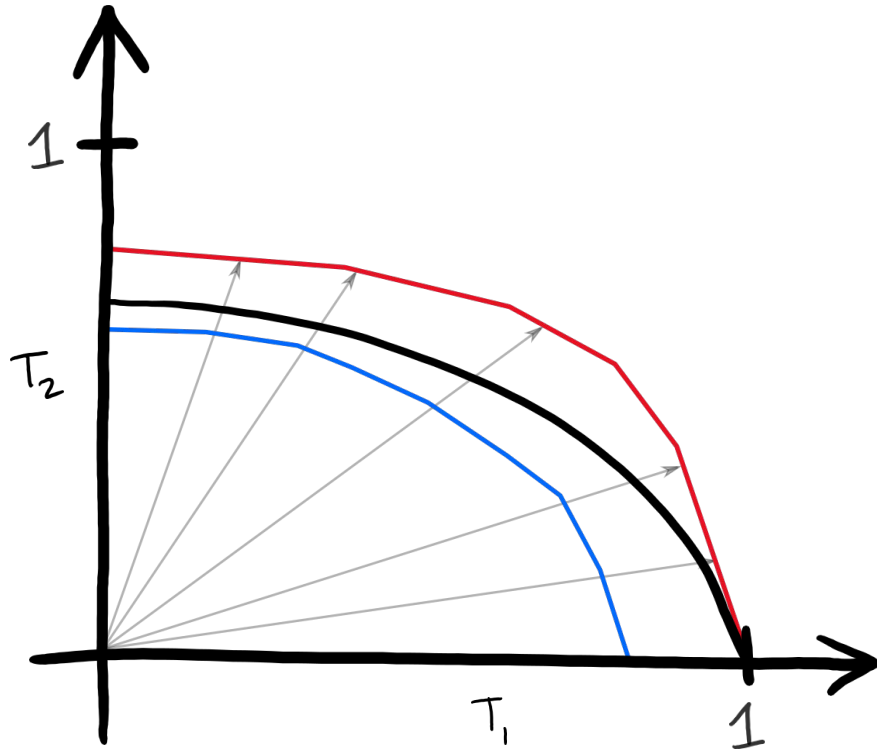
Approximate values of generalized-reachability stochastic games for arbitrarily small precision.

Our contribution



Over-approximation need not converge
(multiple fixpoints)

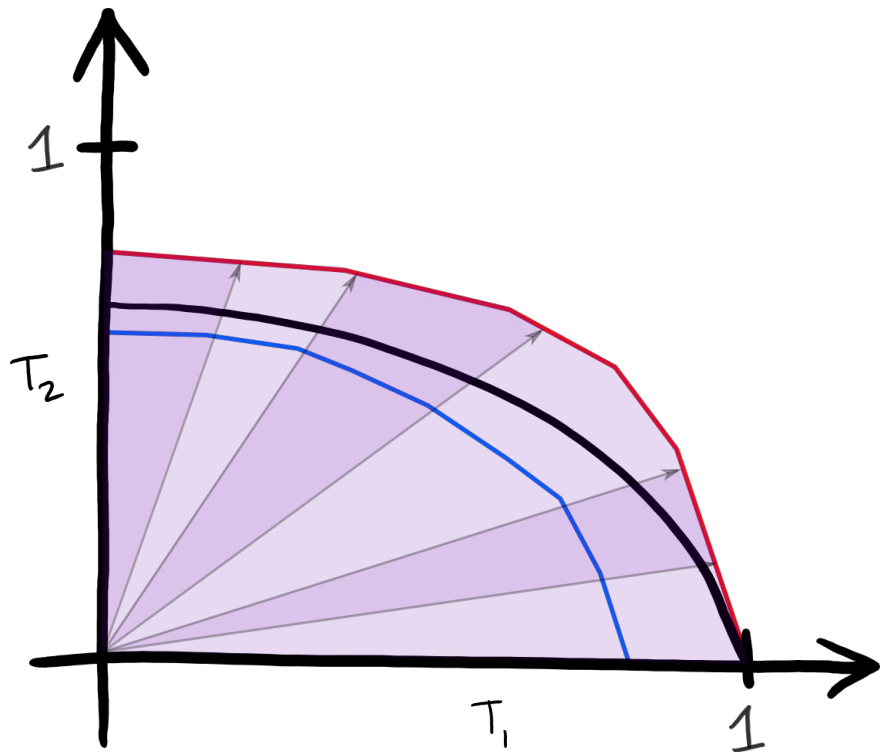
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- Group directions into regions

Context

	Single-dim SG	Multi-dim MDP	Multi-dim SG
Computational complexity	$NP \cap coNP$ [Con92]	PSPACE-complete [RRS15]	
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