

# EE 495 Game Theory and Networked Systems

## Project Proposal

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### 1 Topic and team

I am interested in the theory of Markov games. Specifically, I am interested in the characterization of equilibria of Markov Games. I will be working alone for the final project.

### 2 Description

Loosely based on Chapter 13.1 and 13.2 of Fudenberg and Tirole's textbook [3], I will give an introduction for Markov games, and the characterization of Markov perfect equilibrium. As an application, I will model some Markov games that are encountered in daily life. For example, modelling the “family friendly” game Monopoly as a finite Markov game, and a 2-player Markov bargaining game as studied by Cripps (hopefully providing a sketch of proof of characterization of equilibria) [1]. Finally, moving beyond Markov perfect equilibria, I will explain the folk theorem for Stochastic games, as studied by Dutta [2] and Chantal Marlats [4]. If there is enough space, I will give a short sketch of the proof.

### References

- [1] Martin W. Cripps. “Markov bargaining games”. In: *Journal of Economic Dynamics and Control* 22.3 (1998), pp. 341–355. ISSN: 0165-1889. DOI: [https://doi.org/10.1016/S0165-1889\(97\)00059-6](https://doi.org/10.1016/S0165-1889(97)00059-6). URL: <https://www.sciencedirect.com/science/article/pii/S0165188997000596>.
- [2] Prajit K. Dutta. “A Folk Theorem for Stochastic Games”. In: *Journal of Economic Theory* 66.1 (1995), pp. 1–32. ISSN: 0022-0531. DOI: <https://doi.org/10.1006/jeth.1995.1030>. URL: <https://www.sciencedirect.com/science/article/pii/S0022053185710307>.
- [3] Drew Fudenberg and Jean Tirole. *Game Theory*. The MIT Press, 1991.
- [4] Chantal Marlats. “A Folk theorem for stochastic games with finite horizon”. In: *Economic Theory* 58.3 (2015), pp. 485–507. ISSN: 09382259, 14320479. URL: <http://www.jstor.org/stable/43562996> (visited on 02/24/2025).