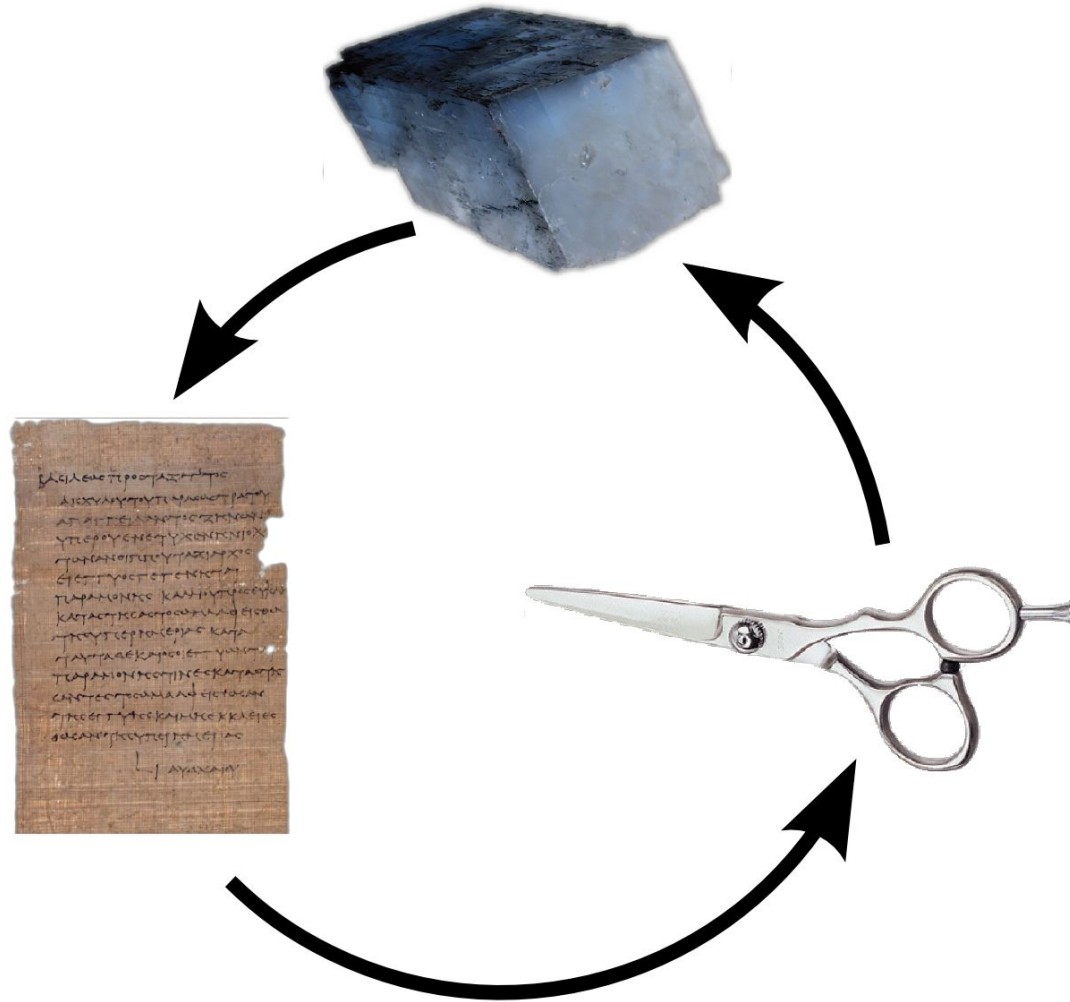# From *Rock, Paper, Scissors* to *Street Fighter II*: Proof by Construction

Yotam I. Gingold

Rock, Paper, Scissors

Matching Pennies
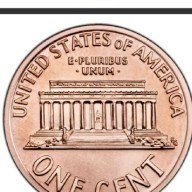
Game Theory

Optimal strategy is choosing randomly. On average, outcome is a draw.

you

me

	1, -1	**-1, 1**
	-1, 1	**1, -1**

The class of RPS-style games

A competitive series of decisions with no long-term advantage accumulation and access at every decision to a set of moves that include trumps of opponents' moves

Choices Graph

Choices Graph
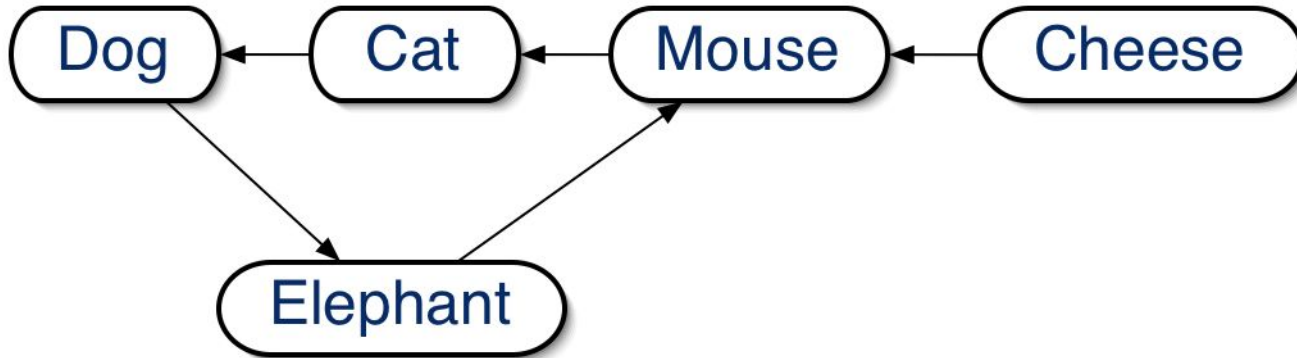
Sinks have no trump

Poker

Credit: Kevin Labianco

Long-term strategy games

Advantage accumulation

Credit: Simon
Pais

Variations

Street Fighter II
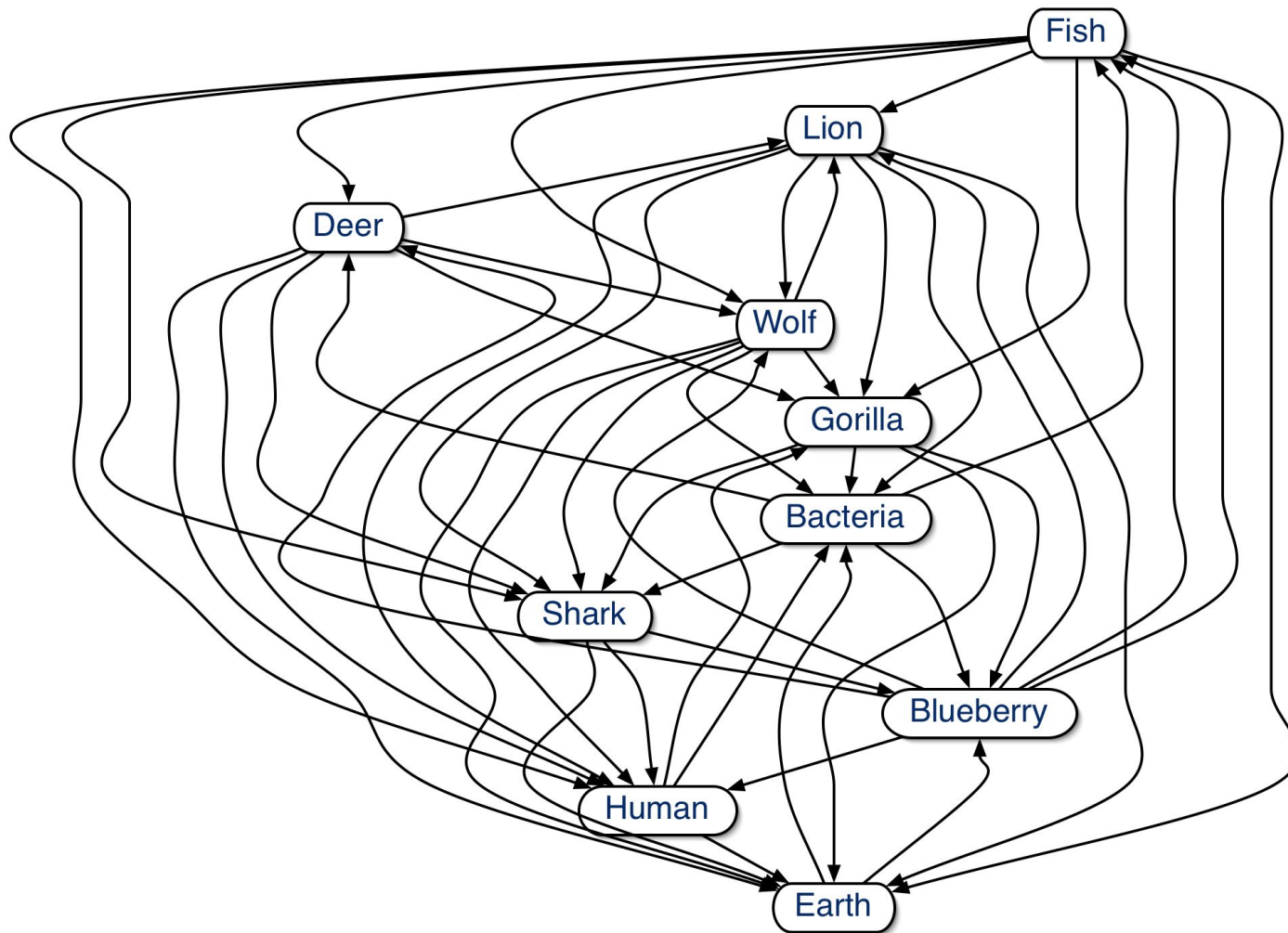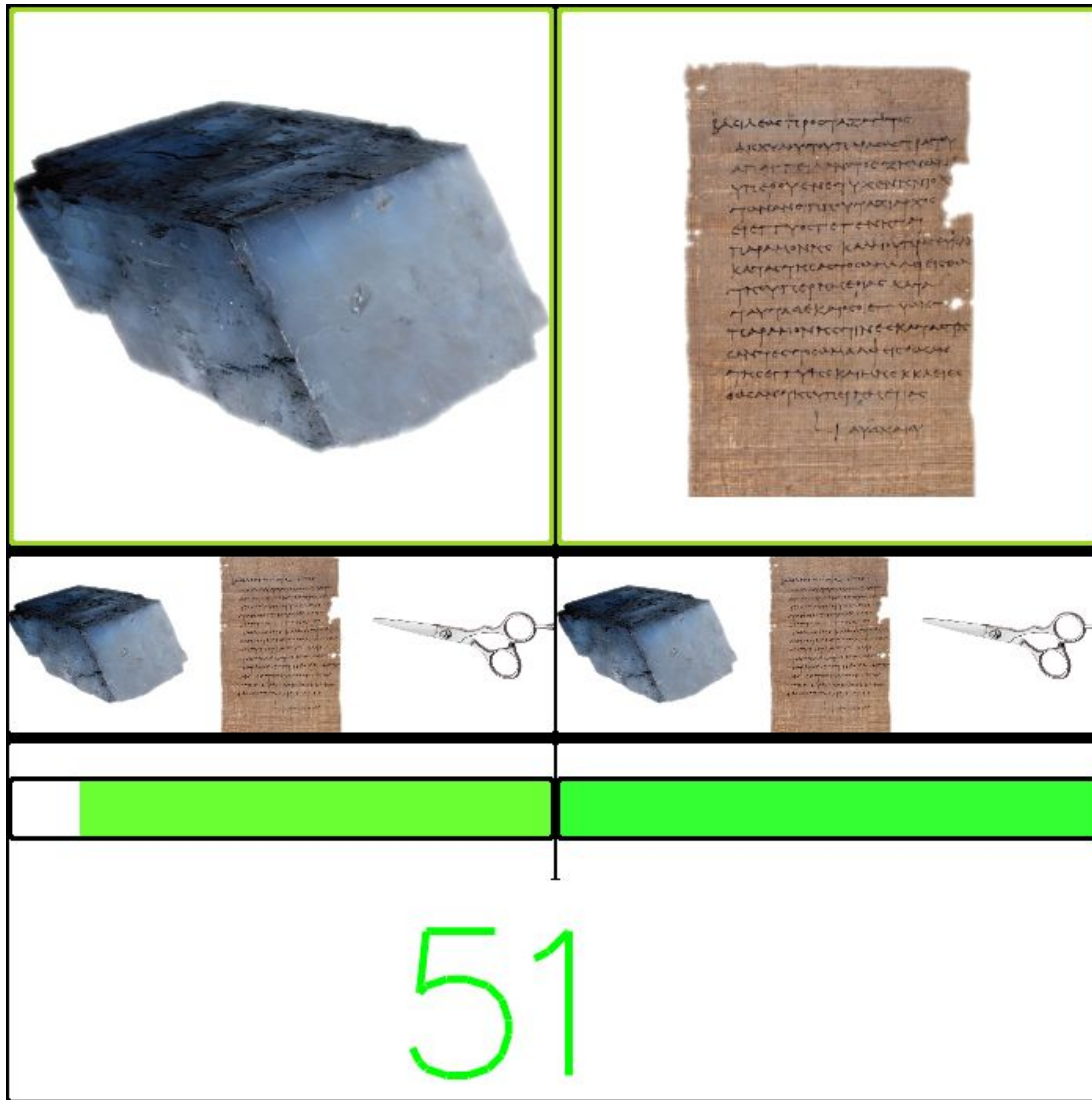
The Dojo / Kung Fu movies

Credit:
myo_sim

Button mashing

Randomly choosing throws

Credit: Advanced Media, Inc.
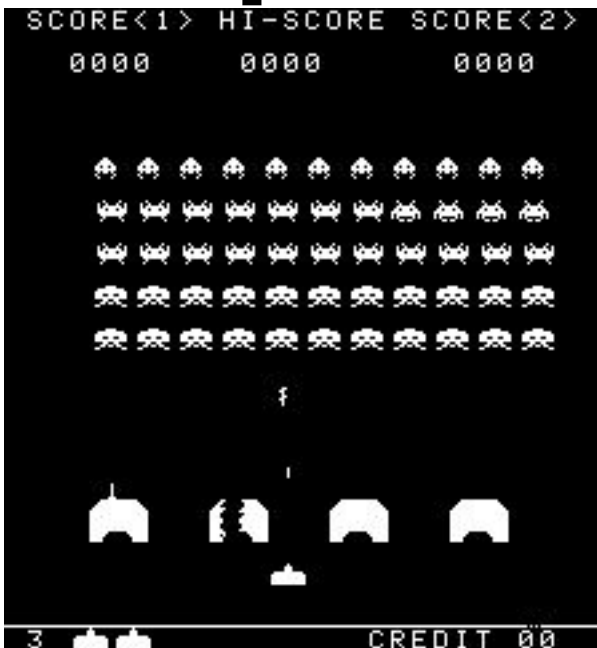
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Street Fighter II variants

Future Work

Choice graph for Street Fighter II

Constructive analysis on other
   game types

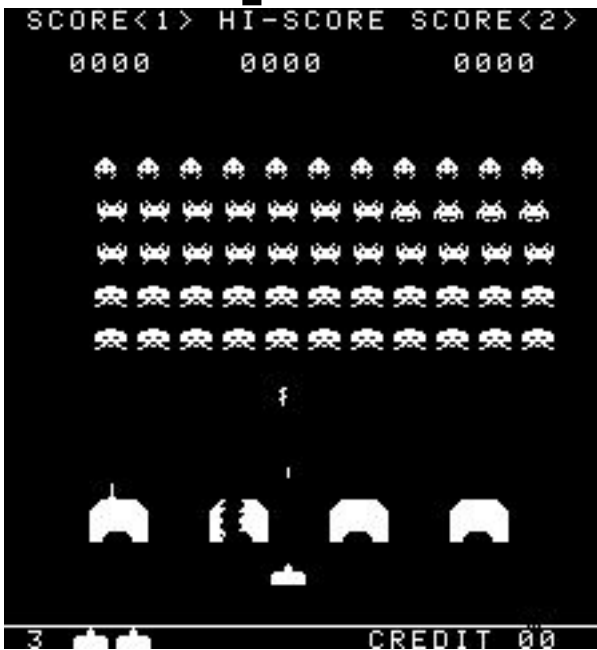# Space Invaders and Doom
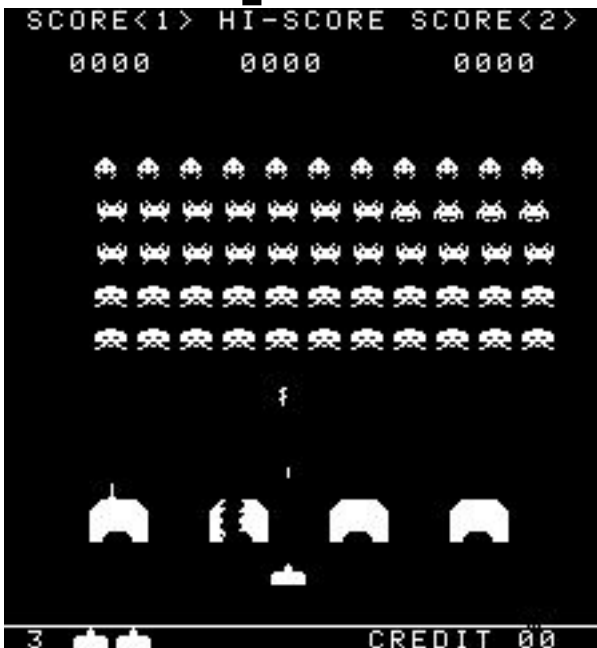
Space Invaders

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Space Invaders and Doom

Space Invaders
Asteroids
Centipede
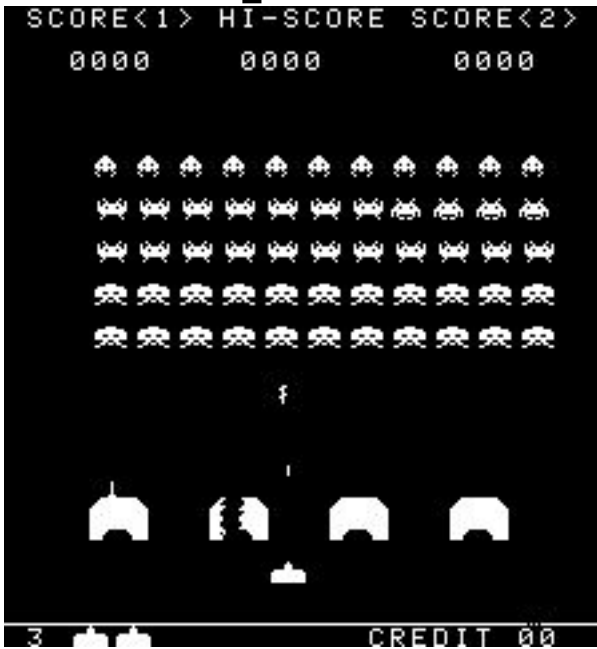
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Space Invaders and Doom

Space Invaders
Asteroids
Centipede
Robotron 2084
Crystal Quest
Contra

Space Invaders and Doom

Space Invaders
Asteroids
Centipede
Robotron 2084
Crystal Quest
Contra
Doom

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Mike Tyson's Punch-Out

Variations

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