

# Prisoners and Spatial Structure

Nikoleta Glynatsi

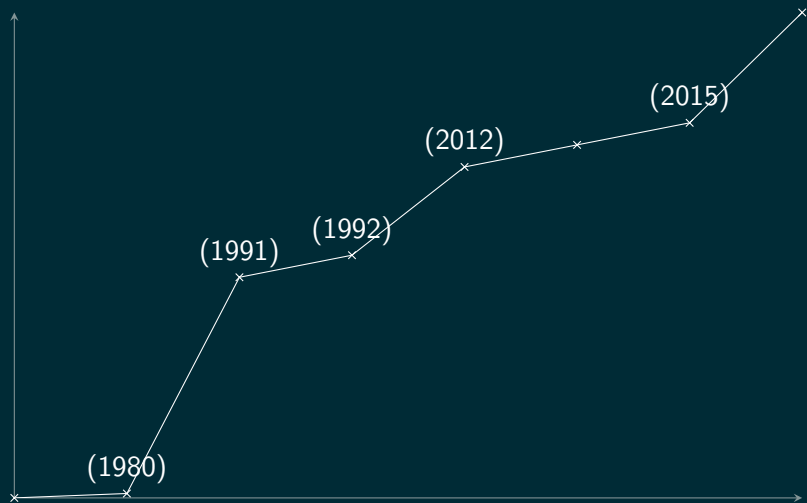


SWORDS, October 2016

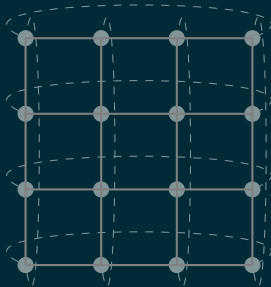
# Prisoners and Spatial Structure

$$\begin{bmatrix} 3, 3 & 0, 5 \\ 5, 0 & 1, 1 \end{bmatrix}$$

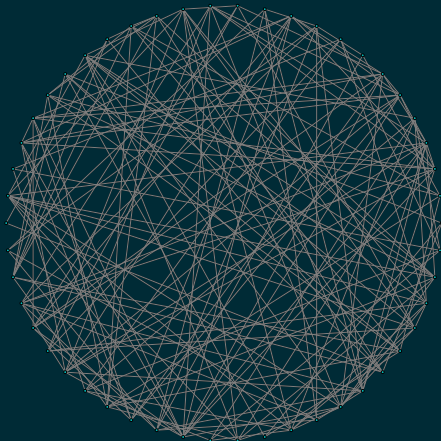
## History Line



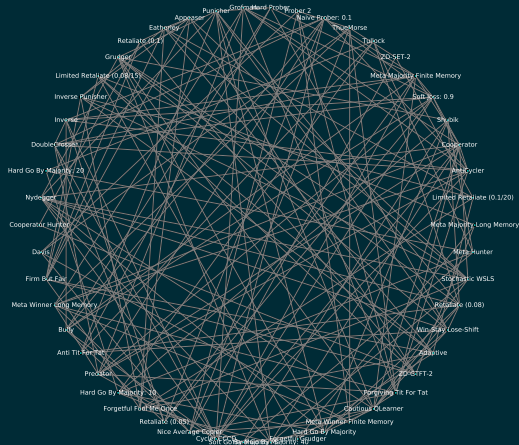
# Nowak and May, 1992



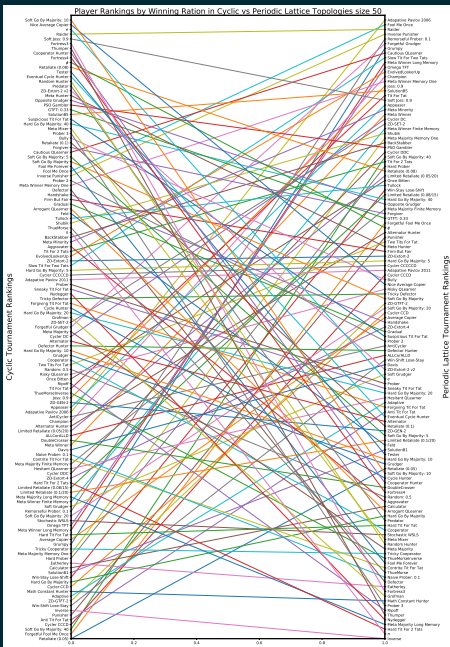
What do real life interactions look like?



## What do real life interactions look like?




# Measurements



# Training a Strategy using Genetic Algorithm

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## MOJONES.NET


### Evolving strategies for an Iterated Prisoner's Dilemma tournament

**Date** 📅 Fri 04 December 2015 **Category** programming **Tags** python / evolution / axelrod / prisoners dilemma / game theory

Heads up to readers: this is a long article with lots of code samples and interactive charts. If you're reading on a mobile device, you might want to save this one until you can get to a wider screen! It may take a while to load all the charts.


#### Introduction

This is a longish post about using a simple evolutionary algorithm in Python to create a strategy for playing the famous Prisoner's Dilemma game (actually, the version known as Iterated Prisoner's Dilemma, hereafter referred to as IPD). If you're not already familiar with the Prisoner's Dilemma, take a look at the first bit of the Wikipedia page and the section on Iterated Prisoner's Dilemma. You might also want to watch this short video and take a look at this blog post.



**About Martin Jones**  
Coding, writing and teaching

**My books**  
Python for Biologists



Evol

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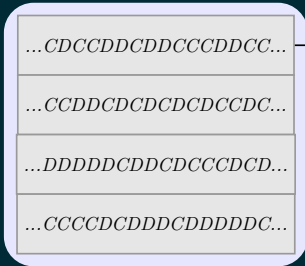
Highlight All

Match Case

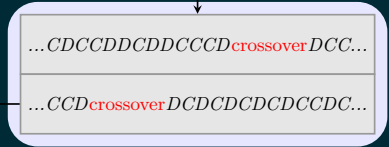
1 of 4 matches



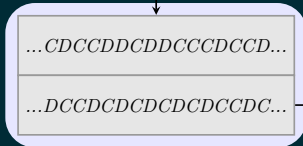
Parents:



Crossovers:



Children:



Mutation:



# Conclusions and Futher Research

## Conclusions

- The topology affects the strategies performance
- Using regression we can predict 2/132 strategies behaviour
- None of the 132 strategies performed well in all experiments
- For specific spatial tournaments a satisfactory strategy has been trained

# Plans for PhD

- Game Theory
- Machine Learning

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<https://github.com/Nikoleta-v3>

<https://github.com/Axelrod-Python/Axelrod>