



Prisoner's Dilemma Competition

CELEBRATING THE
20TH ANNIVERSARY

www.prisoners-dilemma.com

The Prisoner's Dilemma (PD) and Iterated Prisoner's Dilemma (IPD) have been a rich source of research material since the 1950s. However, the publication of Axelrod's book* in the 1980s was largely responsible for bringing this research to the attention of other areas outside of game theory, including evolutionary computation, evolutionary biology, conflict resolution, networked computer systems and promoting cooperation between opposing countries. Despite the large literature base that now exists this is an ongoing area of research.

What is the Prisoner's Dilemma?

In the Prisoner's Dilemma you have to decide whether to cooperate with an opponent, or defect. Both you and your opponent make a choice and then your decisions are revealed. You receive a payoff according to the following matrix – which is just one possible payoff matrix - where the top line is the payoff to the column.

	Cooperate	Defect
Cooperate	R=3 R=3	S=0 T=5
Defect	T=5 S=0	P=1 P=1

- R is a **Reward** for mutual cooperation. Therefore, if both players cooperate then both receive a reward of 3 points.
- If one player defects and the other cooperates then one player receives the **Temptation to defect** payoff (5 in this case) and the other player (the cooperator) receives the **Sucker** payoff (zero in this case).
- If both players defect then they both receive the **Punishment** for mutual defection payoff (1 in this case).

The Competition

We are planning a series of competitions to celebrate, pay tribute to and update the competitions run by Axelrod*. Importantly, we aim to provide the environment to allow researchers to conduct investigations into the latest developments surrounding the Iterated Prisoner's Dilemma. We are planning the following competitions:

1. Re-run the original experiment of Axelrod. We aim to see if a tit-for-tat strategy still dominates or whether somebody can develop a better strategy taking into account that it has been 20 years since the original competition (for example, tit-for-2-tats was claimed to be better than tit-for-tat).
2. Organise a competition that has noise in the data. That is, a signal to cooperate or defect could be mis-executed with a small probability.
3. Allow competitors to submit a strategy to IPD that has more than one player and more than one level of cooperation, that is, multi players and multi choices.

How to enter:

www.prisoners-dilemma.com

The competition will culminate at The Congress on Evolutionary Computation (CEC'04 - <http://cec2004.org/>) in Portland, USA, 20-23 June 2004.

* Axelrod R.M. The Evolution of Cooperation.
BASIC Books, New York, 1984