



# Unbeatable cooperative strategies under noise

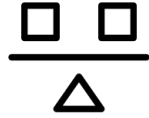
Searching for strategies that are not exploitable and friendly

Raymond Timmermans – Supervisor: Dr. Neil Yorke-Smith

1

## Stability

What does stability mean?



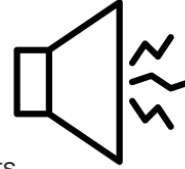
$V(i, i) \geq V(j, i) \leftarrow$  (Collective stability)

If  $V(j, i) > V(i, i) \leftarrow$  (Not exploitable)

$V(i, j)$  is defined as the expected payoff when strategy 'i' plays against 'j'.

2

## Noise



Defined as the probability that the intended action gets flipped. Cooperation rate of TFT players drop to 50% instantly.

3

## Chosen strategies

Strategies that were investigated were strategies that can deal well with noise.



- TFNT, GTFT, CTFT

4

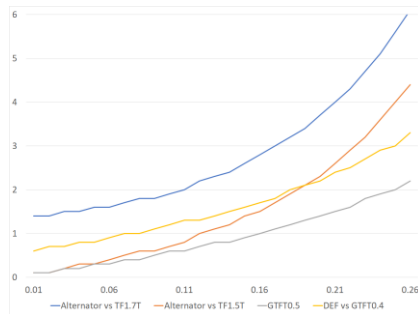
For each strategy

To measure performance and stability three things are needed:

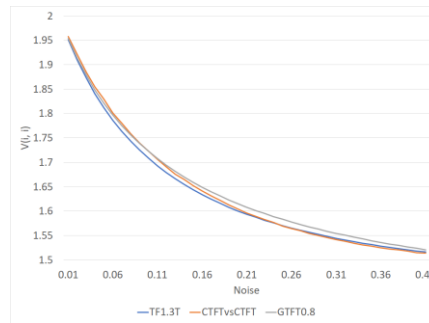
1.  $V(i, i)$
2. The strategy that exploits 'i'
3.  $V(j, i)$

7

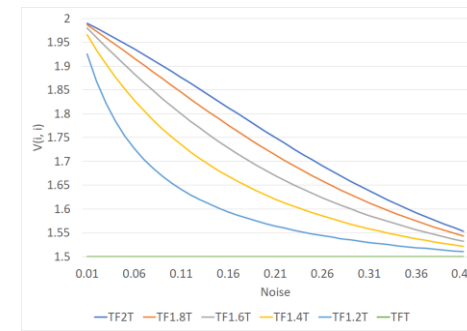
## TFNT vs GTFT



## Performance CTFT



## Performance TFNT



5

