

# Probabilistic Synthesis against GR(1) Winning Condition

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# Problems & Ideas

- Problems of TCP Congestion Control over high speed wireless network
  - What is the probabilistic synthesis?
  - How to obtain the winning probability of the system in the hostile environment?
- Ideas: Adaptive virtual parallel TCP
  - APG: modelling probabilistic game between the system and the environment
  - A modal  $\mu$ -calculus: encoding fairness conditions and reachability for computing the probability of reachability of states

# Main Contributions

- we study the general probabilistic reactive synthesis against GR(1) winning condition based on a novel probabilistic model
- we define a variant of the modal  $\mu$ -calculus and use its formulas to encode fairness conditions and reachability for computing the probability of reachability of states
- we present an efficient algorithm to compute the winning probability of the system and to determine the winning strategies