COGNITION AND BRIDGE

A new field of research initiated by NukkAI

NukkAI, a private lab in Artificial Intelligence (based in Paris), use Bridge game as a sandbox to develop new techniques in AI. Bridge game is particularly interesting because 1- it is an incomplete information game ; 2- it is both, a competitive and a cooperative game ; 3- players need to communicate about their way to play. These features are much closer to real-life interactions, which opens many possibilities of applications of our research. What is more, NukkAI is not so much looking for the perfect play but a play that is adapted to the opponent and a play that is explainable. Explainability is a central drawback of actual AI (or black-box) and a central concern for NukkAI.

In order to build this new AI that could play bridge and explain its decisions, NukkAI choose to reconcile various methods in AI, namely numerical AI and symbolic AI, but also to explore new fields of research that could be useful as cognitive science, the science of human behavior. For now two years, Camille Sauvain, PhD in cognitive science, is working on the idea that players may play differently according to their style. This hypothesis could be used by an artificial agent in order to better understand bids, leads, or line of play of its partner and its opponents.

In order to test this hypothesis, we are currently conducting a study with 50 bridge bidding decisions and 50 questions about players' experience at the table. In order to test this hypothesis, we are currently conducting a study with 50 bridge bidding decisions and 50 questions about players' experience at the table. Brad Moss, Anna Gulevich, Mikael Rimstedt, Sabine Auken and Nevena Senior kindly agreed to help us and shared their answers allowing players who completed the survey to compare their bids to theirs.

This survey is available on **psych.nukk.ai** (english version available by clicking on the flag, or at https://psych.nukk.ai/index-en.html) and lasts approximately 15 minutes. This website also includes information about our research on bridge players' styles and will spread our results.

This beautiful project puts the spotlight on bridge game as a new method, in AI as in cognitive science, to study strategic interactions of human beings. "As a researcher in cognitive science, I am proud to be able to show that bridge game is at the center of scientific concerns" (Camille Sauvain).

If I sat with you for 10 minutes at a bridge table, I would know more about you than your closest relatives do. Because I could see whether you're brave, strong or fearless. Whether you're honest or charming. It reveals everything.

Zia Mahmood, World Champion of bridge, Aces & Knaves, 2021.