Research Review of

"How to advance general game playing artificial intelligence by player modelling"

The main goal of the author in this paper was to propose a generalised game playing model for modern games so as to get rid of constrained ways of looking at particular games. The author compares the state of the art solutions (including DeepMind's AlphaGo and Atari game player) and the issues that were faced by them. Their papers showed that they gave considerably high performance and good strategy building when the games did not contain extensive worlds (over 90% win rate) but when it came to extensive game worlds the "general approach" did not handle strategy very well and gave a poor performance. This can be achieved by :

1. To capture information about player psychology and activity. - This constrains the model of the player behaviour to well understood theoretical constructs.
2. To represent this information in context of the game. - This presents the model as input to a learning algorithm.

The author expects to use "Behavlets" in order to achieve his goal. He describes that the Behavlet process integrates descriptive models for temperament theory, game design patterns and patterns of player interactions. It's core concept is to capture behaviours with certain known bias of personality, including aggression, caution, and thus observe players' self expression. In this paper he also aims to provide a representation of Behavlets as action sequences in a formally defined simulation of a game system.

The author arrives at a model to represent psychological based features of game play and gives a formal framework as :

Model Foundation Definition: A game $G = (X, M, \Phi)$, consisting of:

- the state space $X = \{Xq\}q \in Q$
- a monoid $M = \grave{} \; n \in N \; (U * \cup \Sigma *) \; n$
- a partial action Φ of M on X, such that there exist invariants $Inv(q) \subseteq Xq$

The author argues that it is necessary to include the player perspective and the psychological features as they sometimes play a vital role in determining the results of a game. The result of this paper happens to be a vision for a general player model rather than a complete and final work, which he hopes to serve as an inspiration.

ORIGINAL PAPER BY :- BENJAMIN ULTAN COWLEY BRAINWORK RESEARCH CENTRE FINNISH INSTITUTE OF OCCUPATIONAL HEALTH POBOX 40, HELSINKI 00250, FINLAND COGNITIVE BRAIN RESEARCH GROUP UNIVERSITY OF HELSINKI, FINLAND EMAIL: BEN.COWLEY@HELSINKI.FI