



Special Event @ IEEE SMC 2017: Human and Smart Machine Co-Learning

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IEEE SMC 2017 is the first year to hold Human & Smart Machines Co-Learning. But for the human vs. computer Go competitions, the organizers have been held since 2008. The handicaps for the human vs. computer 19×19 game have been decreased from 29 in 1998 to 0 in 2016. Learning has become a very popular approach for cybernetics systems. This topic has always been considered a research in the Computational Intelligence area. Nevertheless, when talking about smart machines, it is not just about the methodologies. We need to consider systems and cybernetics. Sometimes, we also need to include human in the loop. Thus, it is definitely a research topic in SMC Society. Rémi Coulom, a freelance developer of Go programs, said “Online games are usually played at a faster pace, which favors the computer over humans,” and he still expected a strong correlation with performance in serious slow tournament games. We hope this special event will attract more scholars in this area to join SMC conference and then join the SMC society. Smart machine is the main theme of IEEE SMC 2017. It is good to use this competition of professional players vs. smart machine and also have some cooperation between them to attract more attentions of worldwide scholars to SMC conferences, including: (1) To integrate the open source FAIR Darkforest (DF) program of Facebook (USA) with Item Response Theory (IRT) of NUTN (Taiwan) to the new open Go system, namely Dynamic DF (DyNaDF or DDF, Dynamic Darkforest) Go system; (2) To integrate DyNaDF Go with FujiSoft Robot of TMU (leading by Prof. Kubota Lab., Japan) namely Robotic DyNaDF Go system; (3) To invite professional Go players to attend the activity to have Go game on site with smart machine.

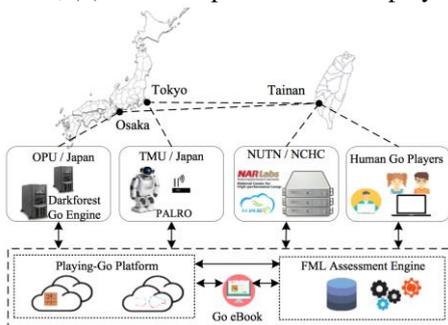


Fig. 1

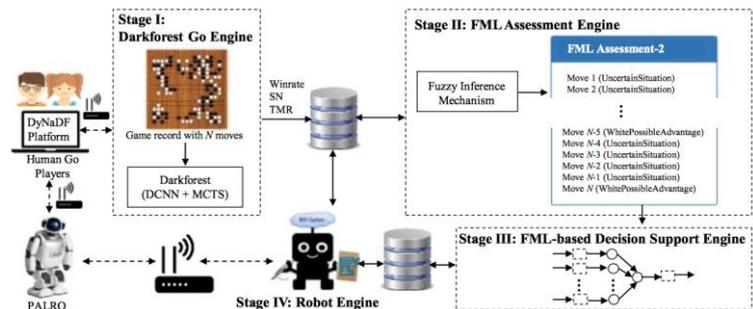


Fig. 2

Previous human vs. machine Go playing competitions have focused on having machines compete with humans. This special event presents both this aspect and the new aspect of having machines and humans collaboration. In this competition, students and researchers will propose new machine learning techniques or apply existing one to create programs that play Go and/or teach humans to play, or suggest better moves. Interestingly, several high-end systems have now been made available as open-source, making it possible to build Go teaching systems on top of existing state-of-the-art game playing technologies. We will invite pre-selected humans and machines (Go competitors) to participate in a high-end Go tournament. For this first event, we intend to invite professional Go players and select proven computer Go systems (<https://sites.google.com/site/dynadfgo/home>). This structure (Figs. 1 and 2) involves 3 stages: Stage 1 provides prediction results of the Darkforest Go engine (Facebook's deep learning Go player), stage 2 infers results of the knowledge-based engine (based on the FML IEEE standard), and stage 3 combines the ML competitor model with the two previous stages to predict the possible winner of the game. We will supply training and test data taken from 60 games from Google Master vs. top professional Go players in Dec. 2016 and in Jan. 2017. The final stage of our system (Stage 4) will include a robot engine, which can speak and explain in real-time the situation to Go players. To that end the ML competitors will have to supply an explanation in text of the proposed (best) moves.

- Human vs. Computer Go: Review and Prospect (<https://arxiv.org/abs/1606.02032>)
- FML-based Dynamic Assessment Agent for Human-Machine Cooperative System on Game of Go (<https://arxiv.org/abs/1707.04828>)
- FML-based Prediction Agent and Its Application to Game of Go (<https://arxiv.org/abs/1704.04719>)

