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Title: Intelligent Agent for Human and Machine Co-Learning on Game of Go

Vita:

Chang-Shing Lee (SM'09) received the Ph.D. degree in Computer Science and Information Engineering from the National Cheng Kung University, Tainan, Taiwan, in 1998. He is currently a Professor with the Department of Computer Science and Information Engineering, National University of Tainan and he was the Dean of Research and Development Office from January 2011 to July 2015. His current research interests include adaptive assessment, intelligent agent, ontology applications, Capability Maturity Model Integration (CMMI), fuzzy theory and applications, and machine learning. He also holds several patents on Fuzzy Markup Language (FML), ontology engineering, document classification, image filtering, and healthcare. He was awarded Certificate of Appreciation for outstanding contributions to the development of IEEE Standard 1855TM-2016 (IEEE Standard for Fuzzy Markup Language). He was the Emergent Technologies Technical Committee (ETTC) Chair of the IEEE Computational Intelligence Society (CIS) from 2009 to 2010 and the ETTC Vice-Chair of the IEEE CIS in 2008. He is also an Associate Editor or Editor Board Member of International Journals, such as IEEE Transactions on Computational Intelligence and AI in Games (IEEE TCIAIG), Applied Intelligence, Soft Computing, Journal of Ambient Intelligence & Humanized Computing (AIHC), International Journal of Fuzzy Systems (IJFS), Journal of Information Science and Engineering (JISE), and Journal of Advanced Computational Intelligence and Intelligent Informatics (JACIII). He also guest edited IEEE TCIAIG, Applied Intelligence, Journal of Internet Technology (JIT), and IJFS. Prof. Lee was awarded the outstanding achievement in Information and Computer Education & Taiwan Academic Network (TANet) by Ministry of Education of Taiwan in 2009 and the excellent or good researcher by National University of Tainan from 2010 to 2016. Additionally, he also served the general co-chair of 2015 IEEE Conference on Computational Intelligence and Games (IEEE CIG 2015), the general chair of the 2015 Conference on Technologies and Applications of Artificial Intelligence (TAAI 2015), the program chair of the 2011 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2011), and the competition chair of the FUZZ-IEEE 2013, the competition co-chair of the FUZZ-IEEE 2015, FUZZ-IEEE 2017, and 2016 IEEE World Congress on Computational Intelligence (IEEE WCCI 2016) and IEEE WCCI 2018. He is also a member of the Program Committees of more than 50 conferences. He is a senior member of the IEEE CIS, a member of the Taiwanese Association for Artificial Intelligence (TAAI), and the Software Engineering Association Taiwan. He was a member of the standing committee of TAAI from 2011 to 2016 and one of the standing supervisors of Academia-Industry Consortium for Southern Taiwan Science Park from 2012 to 2013.

Abstract:

In this talk, we demonstrate the application of Fuzzy Markup Language (FML) to construct an FML-based Dynamic Assessment Agent (FDAA), and we present an FML-based Human–Machine Cooperative System (FHMCS) for the game of Go. The proposed FDAA comprises an intelligent decision-making and learning mechanism, an intelligent game bot, a proximal development agent, and an intelligent agent. The intelligent game bot is based on the open-source code of Facebook’s Darkforest, and it features a representational state transfer application programming interface mechanism. The proximal development agent contains a dynamic assessment mechanism, a GoSocket mechanism, and an FML engine with a fuzzy knowledge base and rule base. The intelligent agent contains a GoSocket engine and a summarization agent that is based on the estimated win rate, real-time simulation number, and matching degree of predicted moves. Additionally, the FML for player performance evaluation and linguistic descriptions for game results commentary are presented. We experimentally verify and validate the performance of the FDAA and variants of the FHMCS by testing five games in 2016 and 60 games of Google’s Master Go, a new version of the AlphaGo program, in January 2017. The experimental results demonstrate that the proposed FDAA can work effectively for Go applications.