**Intelligent e-Learning Systems: Methodologies , Applications and Challenges**

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### *Abstract*—Intelligent e-Learning technology is a challenging field that has witnessed great advances in the last few years. Artificial intelligence (AI) theories and approaches receive increasing attention within this emerging technology .Researchers have been used the AI concepts and methodologies to develop a robust generation of intelligent tutoring and learning systems.Moreover, the convergence of AI and web science is enabling the creation of a new generation of web-based intelligent e-learning systems for all domains and tasks.This paper discusses the AI methodologies and techniques for developing the intelligent e-Learning systems.Foure most popular paradigms are discussed namely; case-based reasoning ,ontological engineering, data mining and intelligent agents.Moreover ,the paper addresses the challenges faced by the application developers and knowledge engineers in developing and deploying AI-based Learning systems. In addition, the paper presents some cases of intelligent learning systems/tools developed by the author and his colleagues at Artificial intelligence and Knowledge Engineering Research Labs, Ain Shams University, AIKE Labs-ASU , Cairo,Egypt.