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| --- | --- | --- | --- | --- | --- | --- |
| **TSC Category** | Development and Implementation | | | | | |
| **TSC Title** | Intelligent Reasoning | | | | | |
| **TSC Description** | Design and build intelligent machine reasoning systems that can integrate, make sense of, and act upon heterogeneous sensory information sources, using domain knowledge accumulated in respective industries | | | | | |
| **TSC Proficiency Description** | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** |
|  |  |  | **ICT-ACE-4030-1.1** | **ICT-ACE-5030-1.1** |  |
|  |  |  | Build knowledge-based intelligent software applications using machine reasoning techniques and computer programming | Evaluate, design and build intelligent software systems |  |
| **Knowledge** |  |  |  | * Machine reasoning applications and technology * Core machine reasoning techniques * Components and techniques in knowledge-based systems * Reasoning system architectures * Requirements and explainability formachine learning systems * Types and sources of uncertainty and certainty factor technique * Contemporary machine reasoning systems * AI Ethics | * Cognitive systems * Cognitive knowledge representation and techniques * Speech comprehension and processing * Vision comprehension and processing * Natural language comprehension and processing * Reasoning systems * Search techniques for search-based reasoning applications * Optimisation techniques for optimisation reasoning applications * Knowledge discovery techniques for reasoning applications * Hybrid reasoning systems * Data mining framework * AI Ethics |  |
| **Abilities** |  |  |  | * Analyse the business drivers and main application areas of machine reasoning * Analyse reasoning systems for problem solving * Analyse the forms to organise and represent knowledge, business rules and natural language * Analyse techniques to draw new conclusions based on existing knowledge rules and new facts * Analyse characteristics and results evaluation of advanced computational deductive reasoning techniques * Examine uncertainty issues in machine learning * Analyse characteristics and results evaluation of uncertainty handling techniques * Apply logical inference to deduce new conclusions * Evaluate performance of advanced mathematical models, inductive and deductive reasoning techniques * Design and create reasoning systems | * Identify required cognitive functions based on business needs * Design cognitive applications based on business requirements * Analyse business drivers and application areas of intelligent reasoning systems * Design and apply search techniques to realise expected business outcomes * De-compose complex application scenarios into subproblems * Resolve subproblems by assembling cooperative intelligent subsystems * Design cooperative reasoning modules based on decomposed business outcomes * Create hybrid reasoning systems by applying suitable techniques and computer programming * Build reasoning systems using hybrid reasoning techniques and sub-modules |  |
| **Range of Application** |  | | | | | |