

SKILLS FRAMEWORK FOR INFOCOMM TECHNOLOGY TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT

TSC Category	Development and Implementation					
TSC Title	Self-learning Systems					
TSC Description	Design and develop self-learning systems using reinforcement learning and evolutionary learning techniques					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			ICT-DIT-3028-1.1	ICT-DIT-4028-1.1	ICT-DIT-5028-1.1	
			Analyse, articulate and apply key artificial intelligence (AI) technologies in their work and that of the teams and organisation, in the area of business process automation and optimisation	Plan the end-to-end process to design, build and deploy adaptive software robots in hardware and devices, validating and optimising software robots in different application areas	Design and develop self-learning systems using reinforcement learning and evolutionary learning techniques	
Knowledge			<ul style="list-style-type: none"> Overview of robotic process automation (RPA), cognitive RPA, and artificial intelligence (AI) Tooling tutorials Data analysis and manipulation using virtual worker Processing supplier invoice using virtual workers Remote enterprise applications Data processing and management Enterprise deployment methodology and tools Quality assurance and system debugging Intelligent Process Automation (IPA) project management Open source IPA tools, installation and use cases 	<ul style="list-style-type: none"> Autonomy and agency Automating repetitive tasks Differences between Single agents and multiple agents Sequences, flowchart, State Machine Workflow User interface automation System activities and user events Recording and scraping websites Testing and debugging Multi-agent robots Industry best practices in software robots Application integration Embedding and deploying robots Validation and verification 	<ul style="list-style-type: none"> Types and applications of self-learning systems Reinforcement learning process and approaches Concepts and algorithms of Deep Reinforcement Learning (DRL) Fundamentals of reinforcement learning and evolutionary learning techniques Evolutionary learning Evolutionary intelligent systems and its architecture and applications Evolutionary computation techniques 	

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			<ul style="list-style-type: none"> Automation using AI functionalities Open-source conversational software robots fundamentals and installation 			
Abilities			<ul style="list-style-type: none"> Analyse business drivers and main application areas of IPA Create automation applications using RPA as an integration tool between different enterprise applications Create virtual workers for productivity without increasing actual workforce and/or hiring Create automation applications with remote enterprise applications Automate data processing and extraction from image documents Deploy enterprise-scale automation applications Manage IPA project lifecycle Create business automation applications using cost-saving robotic automation tools and AI tools Create digital 'virtual assistants' Evaluate industrial IPA use cases 	<ul style="list-style-type: none"> Determine the best practices for building autonomous software robots Plan the processes to design and build software robots Define the technical requirements needed for the software robots Construct fully functional software robots Validate the design of the software robots Introduce new and/or best practices in the design and planning of the software robots Gather feedback on the performance of the software robots Review the coding, testing and design criteria Optimise the performance of the software robots during and after deployment 	<ul style="list-style-type: none"> Apply the concepts and algorithms of reinforcement learning Identify the requirements for self-learning systems Build deep reinforcement learning systems Build model-based reinforcement learning systems Build evolutionary learning systems using evolutionary computation techniques to solve optimisation problems Assess the system performance and suggest possible improvements 	
Range of Application						