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| **TSC Category** | Development and Implementation | | | | | |
| **TSC Title** | Text Analytics and Processing | | | | | |
| **TSC Description** | Identify, extract and analyse text data using text analytics solutions to discover themes, patterns and trends | | | | | |
| **TSC Proficiency Description** | **Level 1** | **Level 2** | **Level 3** | **Level 4** | **Level 5** | **Level 6** |
|  |  |  | **ICT-DIT-4029-1.1** | **ICT-DIT-5029-1.1** | **ICT-DIT-6029-1.1** |
|  |  |  | Analyse text data to discover themes, patterns and trends to improve business processes and decision making | Implement advanced machine learning techniques in building natural language processing (NLP) models for performing common text processing tasks | Design and implement systems that can interact with users using spoken or written natural language |
| **Knowledge** |  |  |  | * Text analytics tasks, applications areas, tools and their features * Cross-Industry Standard Process for Data Mining (CRISP-DM) in text analytics * Text mining process and pre-processing * Information extraction methods * Concept clustering * Text link analysis * Categorisation methods and rules * Core concepts and tasks in sentiment mining * Applications, difficulties and solutions for sentiment mining * Sentiment detection and classification * Topic and aspect extraction * Sentiment summarisation and visualisation | * Application areas of NLP * NLP and deep learning * Deep learning foundations * Matrix calculus for deep learning * Backpropagation * Pros and cons of count and prediction- based Word Embedding * Word embedding algorithms * Similarity measures * Text classification, regularisation and loss function * Language models and recurrent neural networks (RNN) * Encoder-decodeer models * Memory networks * NLP and bayesian methods * Parsing | * Conversational user interfaces (UIs) * Common roles and applications with conversational UIs * Main concepts, architecture and components of conversational UIs * Conversation design * Natural language understanding techniques * Response generation * Conversational UI with speech * Systems that can interact with users including chatbots and virtual assistants |
| **Abilities** |  |  |  | * Identify text analytics solutions and platform requirements based on the business requirements and analytical objectives * Define the metadata and corpus for the data to be imported into the text analytics repository * Develop standardised sets of text analytics artifacts with the relevant stakeholders * Develop term-document frequency matrices to enable look-up of text and documents within the corpus * Modify the text analytics solutions to ensure that it produces the expected results * Define the processes to perform text analytics based on the business requirements and text analytics artifacts * Detect and classify sentiments in textual data from social media * Find out what the sentiments are about by identifying the targets and their aspects * Summarise, visualise and present sentiment monitoring for management support | * Identify common tasks associated with text data * Represent text data word as embeddings and reviews similarity measures for word semantics * Model text as n-gram language models and RNN * Determine the machine learning approach suitable for text data analytics * Train the model by monitoring and tweaking its sub-components * Determine the strategies to be used to augment memory networks | * Determine the roles that systems with conversational UI can play in fielded applications * Identify and analyse the main components and the architectures of conversational interfaces * Design conversational UI following practical methodologies and strategies * Develop applications with conversational UI using traditional and machine learning approaches * Generate responses to the users through natural language generation * Evaluate the performance of the conversational UI using appropriate metrics * Handle speech input and output for conversational UI using prevalent techniques |
| **Range of Application** |  | | | | | |