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| **Technical Stream** | **Description:**  Develop a Quantum Convolutional Neural Network (QCNN) model using Qiskit to classify data from NASA's Astronomy Picture of the Day (APOD) dataset.  **Aim:** Design and implement a Qiskit-based QCNN model to classify and analyse NASA's APOD images, exploring the potential of quantum computing in image classification.  **Objectives:**   * Extract and analyse the APOD dataset from NASA’s API, ensuring a clear understanding of the data and its classification scenario. * Develop a robust strategy for implementing the Quantum Convolutional Neural Network (QCNN) model. * Build and train a QCNN model using Qiskit to classify APOD images. * Interpret the model performance of QCNN and compare its results with classical Convolutional Neural Network (CNN) used in existing research.   **Deliverable:**   * Prepare a PowerPoint presentation (maximum of 5 minutes to present your work) to showcase your understanding, methodology, and results in alignment with the outlined objectives.   **Tools and Dataset:**  Below, you are required to use the following programming languages, software's and dataset as follows: -   * **Programming Language:** Python * **Frameworks and Platforms:**   + Qiskit SDK   + Visual Studio   + IBM Quantum platform * **Dataset Source:**   + You will use create an account via link provided to access the NASA API account: <https://api.nasa.gov/> The data that you will need to extract from the website to create dataset is based on Astronomy Picture of the Day (APOD) data. |
|  | **Description:**  Develop a health data classification and prediction model using Qiskit, leveraging Quantum AutoEncoder and Quantum Recurrent Neural Network (QRNN) methodologies.  **Aim:** Design and implement a Qiskit-based model to classify health data and predict a subject's health state, utilising Quantum AutoEncoder and QRNN approaches.  **Objectives:**   * Analyse and understand the dataset and the context of the health scenario being addressed * Develop a clear and actionable strategy for implementing the Quantum AutoEncoder and QRNN models. * Build and train Quantum AutoEncoder and QRNN models using Qiskit. * Interpret the model performance of AutoEncoder and QRNN model and comparing them against results from classical Convolutional Neural Network (CNN) in existing research   **Deliverable:**   * Prepare a PowerPoint presentation (maximum of 5 minutes to present your work) to demonstrate your understanding, methodology, and outcomes based on the outlined objectives.   **Tools and Dataset:**  Below, you are required to use the following programming languages, software's and dataset as follows: -   * **Programming Language:** Python * **Frameworks and Platforms:**   + Qiskit SDK   + Visual Studio   + IBM Quantum Platform * **Use of one of the datasets:**    + <https://www.kaggle.com/datasets/manideepreddy966/wearables-dataset>   + <https://www.kaggle.com/datasets/gustavojota/samsung-heart-rate-fit2>   + <https://www.kaggle.com/datasets/manideepreddy966/wearables-dataset>   + https://www.kaggle.com/datasets/vshantam/health-detection-using-smart-phone-data |
| **Business Stream** | **Description:**  This project focuses on leveraging Quantum AI to address business challenges in the health sector by using health data to propose innovative solutions and strategies.  **Aim:** Develop a Quantum AI strategy and solution tailored for health-related business applications.  **Objectives:**   * Define the business challenges and opportunities in the health sector where innovative solutions are required. * Identify and evaluate health data sources relevant to addressing the identified business challenges, such as Google Health Data or Samsung Health Data. * Analyse potential business scenarios where advanced technologies, such as Quantum AI, could be applied to improve outcomes and decision-making. * Examine organisations or sectors in health that would benefit from innovative strategies, highlighting needs and alignment opportunities. * Conduct a comprehensive risk mapping exercise to identify challenges and constraints related to implementing advanced solutions in the health business domain. * Evaluate the potential business impact of implementing proposed solutions, focusing on efficiency, resource utilization, and strategic alignment.   **Deliverable:**   * Create a business case, including resource requirements, potential benefits, and actionable recommendations to support decision-making and strategy formulation into a form of PowerPoint presentation. You will have a maximum of 5 minutes to present your work.   **Dataset:**  Select and utilise one of the following datasets:   * <https://www.kaggle.com/datasets/manideepreddy966/wearables-dataset> * <https://www.kaggle.com/datasets/gustavojota/samsung-heart-rate-fit2> * <https://www.kaggle.com/datasets/manideepreddy966/wearables-dataset> * https://www.kaggle.com/datasets/vshantam/health-detection-using-smart-phone-data |

Notes of meeting:

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| * + website - sign up   + advertise two and half months before April   + release the problem three weeks ahead   + couple of emails a week   + drop - in - webinar   + social media/linked in   + Directors/Student society |
| Priority - Two strands - develop the pack of the problem |
| deadline : before xmas |
| github repo - |
| Wednesday 18th after 3 |