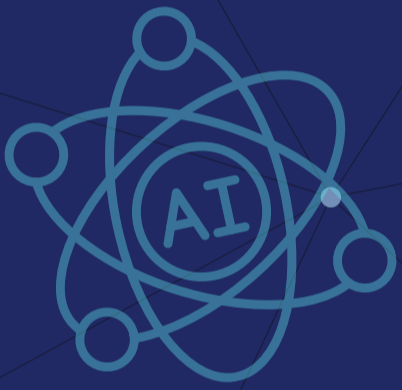# FACULTY DEVELOPMENT PROGRAM ON AI/ML

May 11, 12

VIMAL JYOTHI ENGINEERING COLLEGE, CHEMPERI

About

Vimal Jyothi Engineering College (VJEC) is an educational project of the Archdiocese of Thallassery established in the year 2002 and is managed by Meshar Diocesan Educational Trust. The college is approved by AICTE and affiliated to APJ Abdul Kalam Technological University (KTU). VJEC is a self-financing catholic minority institution aiming at generating a fervor for Engineering and Technology in students. Here we inspire, nurture and foster them to realize their career potential in the field of Engineering and Technology.

With profound insight into the resource requirements of the higher education system, VJEC has proudly set up world-class infrastructure complemented with intellectual capital in the form of competent faculty. Many of the facilities are way beyond the regulatory requirements aiming for learning beyond the syllabus to address the requirements of the industry. These material facilities along with value addition programs and student support systems are the integral facets of empowerment at VJEC.

Digital library, industry supported project labs, language lab, and student chapters of professional bodies such as IEEE, ISOI, IETE, SAE, CSI offer an extensive range of resources, opportunities and services to the outcome based teaching learning process. Effective implementation of quality control processes ensure Engineering graduates with the expected level of knowledge, skill and attitude.

Vision

To bloom into a Center of Excellence for Technical Education and a pace-setter in rural India with its quality processes and procedures, interwoven with freedom of flexibility, moulding professionals of superior quality, dedicated to the progress and development of Humanity.

Mission

To prepare the students to see beyond geographical limit and belong to a new age of acquisition and application of technology to meet the challenges of the changing world. Inspired and guided by gospel values ,we contribute to the socioeconomic welfare of the country with due concern to the marginalized.

Department of Computer Science and Engineering

Vimal Jyothi Engineering College (VJEC) is an educational project of the Archdiocese of Thallassery established in the year 2002 and is managed by Meshar Diocesan Educational Trust. The college is approved by AICTE and affiliated to APJ Abdul Kalam Technological University (KTU). VJEC is a self-financing catholic minority institution aiming at generating a fervor for Engineering and Technology in students. Here we inspire, nurture and foster them to realize their career potential in the field of Engineering and Technology. With profound insight into the resource requirements of the higher education system, VJEC has proudly set up world-class infrastructure complemented with intellectual capital in the form of competent faculty. Many of the facilities are way beyond the regulatory requirements aiming for learning beyond the syllabus to address the requirements of the industry. These material facilities along with value addition programs and student support systems are the integral facets of empowerment at VJEC. Digital library, industry supported project labs, language lab, and student chapters of professional bodies such as IEEE, ISOI, IETE, SAE, CSI,ACM offer an extensive range of resources, opportunities and services to the outcome based teaching learning process. Effective implementation of quality control processes ensure Engineering graduates with the expected level of knowledge, skill and attitude.

Vision

To contribute to the society through excellence in scientific and knowledge-based education utilizing the potential of computer science and engineering with a deep passion for wisdom, culture and values.

Mission

To promote all-round growth of an individual by creating futuristic environment that fosters critical thinking, dynamism and innovation to transform them into globally competitive professionals.

To undertake collaborative projects which offer opportunities for long-term interaction with academia and industry.

To develop human potential to its fullest extent so that intellectually capable and optimistic leaders can emerge in a range of professions.

Curriculum

1. Industry tools, technologies & platforms
- Git, Python, VSCode
- Anaconda, Jupyter Lab
- PyTorch, TensorFlow, Scikit-Learn, Keras, ONNX
- Containerization with Docker & Kubernetes
- GPU
- Cloud Computing
- System set-up and Resources for Workshop.

2. Machine Learning - Regression
- Parametric methods
- Non-parametric method
- Data processing techniques
- Dimensionality Reduction
- Bias Variance Trade-offs
- Regularization
- Cost Function
- Optimization Techniques
- Model evaluation
- Linear Regression – Implement from scratch using NumPy
- Interpretability
- Non-Linear Models for Regression

3. Machine Learning - Classification
- Data processing techniques
- Logistic Regression
- Naïve Bayes
- Decision Tree,
- Bagging - Random Forest
- Boosting
- Stacking
- Support Vector Machines
- Cost Function & Optimization Techniques
- Model Evaluation
- Model Selection
- Hands-on Lab - Implement Logistic Regression and Naïve
- Bayes from Scratch (without using any frameworks)
- Hands-on Lab - Build, Evaluate and Select Models using ML Frameworks

4. Machine Learning - Clustering
- Hierarchical Clustering
- Density Based Clustering
- Centroid Based Clustering: K-Means
- Advantages and Disadvantages
- Distance Measures
- Cost Function
- Model Evaluation
- Techniques for choosing K
- Hands-on Lab – Implement K-Means, K-Means++

5. Artificial Neural Networks
- Multilevel Perceptron
- Activation Functions
- Batch Normalization
- Regularization
- Cost Function
- Back propagation
- Optimization Techniques
- Hyperparameter tuning

Curriculum

6. Deep Learning

- Convolutional Neural Networks
- Recurrent Neural Networks
- LSTM
- GRU
- Applications - NLP, Computer Vision, Speech
- Unstructured Data Processing
- Word Embeddings - Word2Vec, Glove
- CBOW, Skip-gram
- Transfer Learning
- Encoder-decoder models
- Hands-on Lab: Build a Text classifier using
- Traditional ML Model
- Hands-on Lab: Build a Text Classifier using Deep Learning

7. Advanced ML/DL | Industry Trends Project & Research Areas

- Large Language Models (LLMs)
- Multilingual LLMs
- GPT -3, GPT-3.5, GPT-4, ChatGPT
- OpenAI, Hugging Face
- Reusing pre-trained LLMs
- Fine-tuning LLMs - Transfer Learning
- Application Areas
- Project/Research Ideas
- Authoring Research Papers | Conferences | Journals

RESOURCE PERSON

BINIL KURIACHAN

SR. APPLIED SCIENTIST
MICROSOFT

Binil Kuriachan is a Sr. Applied Scientist at Microsoft (R&D) working on Cybersecurity Research with more than 10 years of industrial experience specialising in AI/ML. He has done his master's in computer science from Arizona State University, USA and pursued research in information systems from IITM. Binil has handled multiple AI projects comprising of natural language processing, information retrieval, personalization, supply chain, geospatial modelling, cybersecurity etc. in his industrial career. He is an expert in designing and building scalable machine learning and deep learning pipelines. Binil has 7 research papers and 20+ certifications in Machine Learning, Deep Learning, Data Structures, Algorithms etc. to his credit.

REGISTER NOW!

REGISTRATION FEE - 2000/-

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Applicants can fill the registration form through the below link.

https://docs.google.com/forms/d/1E8gIRiFJcdkbsEd6Ly8B6PkYVK0XinL9Eb99Wp-oSTg/edit

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