



**Report on Guest Lecture on**  
**‘Harnessing Deep Learning Technique for Enhanced Microvasculature segmentation’**  
**Organized by Department of Computer Science & Engineering**  
**19.09.2024**

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE**  
(UGC-AUTONOMOUS INSTITUTION)  
Madanapalle - 517325, Annamayya Dist., Andhra Pradesh, India

**Guest Lecture**  
on  
**Harnessing Deep Learning Technique for Enhanced Microvasculature Segmentation**

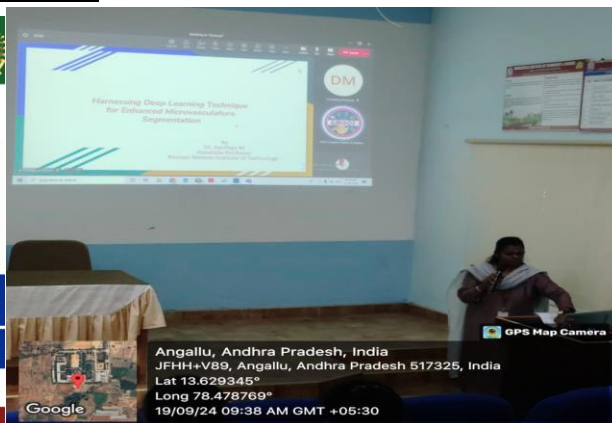
Organized by  
**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
in association with IEEE

Date : 19/09/2024 Time : 9:30 AM to 11:30 AM Venue : Seminar Hall-B Mode : Online

**Resource Person**  
**Dr. M. Karthiga**  
Associate Professor, Department of Computer Science and Engineering  
Bannari Amman Institute of Technology, Tamil Nadu

<b>Chief Patron</b> Dr. N. Vijaya Bhaskar Choudary Secretary & Correspondent	<b>Patron</b> Mrs. Keerthi Nadella Executive Director	<b>Co-Patron</b> Dr. C. Varadani Principal	<b>Convener</b> Dr. M. Sreedevi HOD: Dept. of CSE	<b>Co-ordinator</b> Ms. Ramya Palaniappan Assistant Professor/CSE
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The program was organized by Ms. Ramya Palaniappan, Assistant Professor in the Department of Computer Science & Engineering (CSE) at Madanapalle Institute of Technology & Science, Madanapalle. The event commenced at 9:30 AM in Seminar Hall-B.

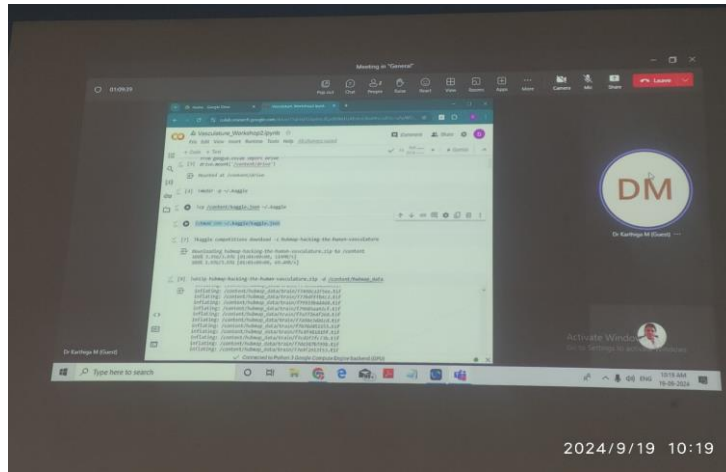
Dr. M. Sreedevi, Head of the CSE Department, welcomed the resource person and the students. Dr. M. Karthiga, Associate Professor in the Department of Computer Science & Engineering at Bannari Amman Institute of Technology, Tamil Nadu, was invited as the resource person to deliver the session. Ms. Ramya Palaniappan introduced the guest and provided a brief overview of her professional background.



The resource person commenced the session by expressing sincere gratitude to the Management, Department, organizing members, and the Head of the CSE Department at MITS, Madanapalle, for the opportunity to share her expertise on applying deep learning techniques to biomedical image analysis. The session was attended by around 70 pre-final year students from the CSE department.

The resource person provided valuable insights into how deep learning has significantly advanced medical image segmentation, enabling the automatic and precise identification of anatomical structures, tumours, and other medical features. She emphasized the importance of microvasculature segmentation, which involves identifying and segmenting small blood vessels (such as capillaries, venules, and arterioles) in medical images. This task is crucial for understanding vascular-related diseases such as diabetic retinopathy, stroke, and cardiovascular conditions.

During the session, she demonstrated how to gather medical image datasets from the Kaggle website using an API token. The implementation process was explained in the Google Colab environment, where she highlighted the role of Exploratory Data Analysis (EDA) in preparing the dataset. She then built a deep learning model, specifically YOLO, to segment small blood vessels from medical images. Furthermore, she discussed various parameters used for tuning the model's performance and explained the metrics employed to measure its effectiveness.



The session provided several key outcomes for the students:

1. **Understanding of Deep Learning in Medical Imaging:** Students gained insights into how deep learning can be applied to medical image segmentation, particularly in identifying anatomical structures and detecting diseases.
2. **Importance of Microvasculature Segmentation:** They learned about the critical role of microvasculature segmentation in diagnosing vascular-related diseases like diabetic retinopathy, stroke, and cardiovascular conditions.
3. **Hands-on Experience with Kaggle and Google Colab:** Students were introduced to the process of gathering medical image datasets from Kaggle using API tokens and implementing solutions in Google Colab, enhancing their practical skills in handling real-world datasets.
4. **Exploratory Data Analysis (EDA):** The importance of EDA in preparing and understanding medical image datasets was highlighted, giving students a foundation in analysing data before model building.
5. **Building a Deep Learning Model:** They gained knowledge about building and training a deep learning model (YOLO) for segmenting small blood vessels, including the key steps involved in model development.

Overall, the session equipped students with both theoretical knowledge and practical skills necessary for applying deep learning techniques for medical image segmentation. The session was concluded by Ms. Ramya P., who expressed her gratitude to the Management and the Department for providing the opportunity to organize the event. She also thanked everyone involved for their support in making the session a success.