AUM
COLLEGE OF BUSINESS

Auburn University Montgomery

INFO6550 – Deep Learning

Computer Vision Research - Poster

You will apply theoretical knowledge in computer vision by exploring publicly available datasets, conducting experiments, and presenting findings in a professional manner suitable for a conference presentation.

In this group project, you will work in teams of 4-5 members to develop a research project in computer vision. Teams will use publicly available datasets to design, implement, and evaluate a computer vision solution. The results will be presented in the form of a **poster** (conference format).

Deliverables:

1. **Research Poster (Preferred Format: 36” x 48”)**
2. **A 5-minute recorded or live presentation, summarizing the research and findings.**
3. **A folder with the following:**
    - **Model Training Notebook.**
    - **Dataset exploration notebook.**
    - **Documentation of the process.**

Suggested Datasets (Choose one or propose another):

- **Kaggle**
- **UCI Machine Learning Repository**
- **Google BigQuery Public Datasets**
- **ImageNet**
- **Microsoft Data for Society**
- **Open Images Dataset**
- **Cityscapes Dataset**
- ***Whichever dataset you propose or use, it must first be approved by the instructor. The Research question must also be first approved by the instructor.***

Guidelines:

1. **Dataset Selection:**
    - Choose a dataset relevant to computer vision challenges such as image classification, segmentation, object detection, or generative models.
    - Computer Vision projects need large amounts of data. The dataset should ideally have thousands of images .
    - When proposing the Research Question and Question, you must show that the data can answer the question.
2. **Research Question and Scope:**
    - Define a clear and concise research question.
    - Narrow the scope to fit the project timeline and group expertise.
3. **Methodology:**
    - Include a description of the preprocessing, model training, and evaluation strategies.
    - Use TensorFlow.
4. **Evaluation Metrics:**
    - Choose metrics appropriate to the problem, e.g., accuracy, F1-score, Intersection over Union (IoU), or other specialized metrics.
5. **Poster Content:**
    - **Abstract:** Give an overview of the research problem and findings.
    - **Introduction**: State the research problem, its significance, and objectives.
    - **Literature**: State the research problem, its significance, and objectives.
    - (Abstract and Introduction are worth 10 points)
    - **Methodology**: Describe dataset selection, preprocessing steps, and modeling approaches.
    - **Results and Discussion**: Present key findings, visualizations, and interpretations.

- **Conclusion and Future Work**: Summarize findings and propose extensions or improvements.
- **References**: Cite all datasets, libraries, and research papers.

6. **Collaboration Tools:**
   - Utilize platforms like Google Colab, GitHub, or Jupyter Notebooks for collaboration.
   - Assign specific roles and responsibilities within the team.

Evaluation Criteria (100 Points):

Poster

1. **Research Problem (15 points):**
   - Clarity, significance, and scope of the research question. This will be in the
2. **Methodology (60 points):**
   - Quality of dataset selection, preprocessing, and modeling.
3. **Results and Insights (15 points):**
   - Validity of results, use of evaluation metrics, and insights derived.

Presentation (10 points):

- Poster design and clarity, and quality of the oral presentation.

Resources for Students:

- Tutorials on machine learning frameworks (TensorFlow, PyTorch, etc.).
- Guidelines for academic poster design.

Notes:

- To get an A. your project must be Innovative and extend beyond baseline implementations to earn bonus points.
- Adherence to ethical AI practices is mandatory.
- Tools for visualization (Matplotlib, Seaborn, Tableau).
- Visit these links for tutorials on tensorflow
    - https://www.youtube.com/watch?v=tPYj3fFJGjk
    - https://playground.tensorflow.org/
    - https://www.youtube.com/@TensorFlow
    - Simplilearn TensorFlow Tutorial for Beginners
- Visit these links for Examples of Poster Presentations
    - University of Maryland - Baltimore
    - University of Illinois Urbana Champaign
    - Animate Yours Science
    - University of Washington