CRCV REU - Week 2

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PROJECT LEAD: DR. YOGESH RAWAT

About Me

- Final-year student at the University of Maryland, Baltimore County
  - Computer Science:
    - Introduction to Machine Learning
    - Software Engineering I
    - Automata Theory and Formal Languages
  - Mathematics:
    - Introduction to Probability and Statistics for Scientists and Engineers
    - Calculus I
    - Calculus II
    - Discrete Mathematics
    - Linear Algebra

Assignment 1

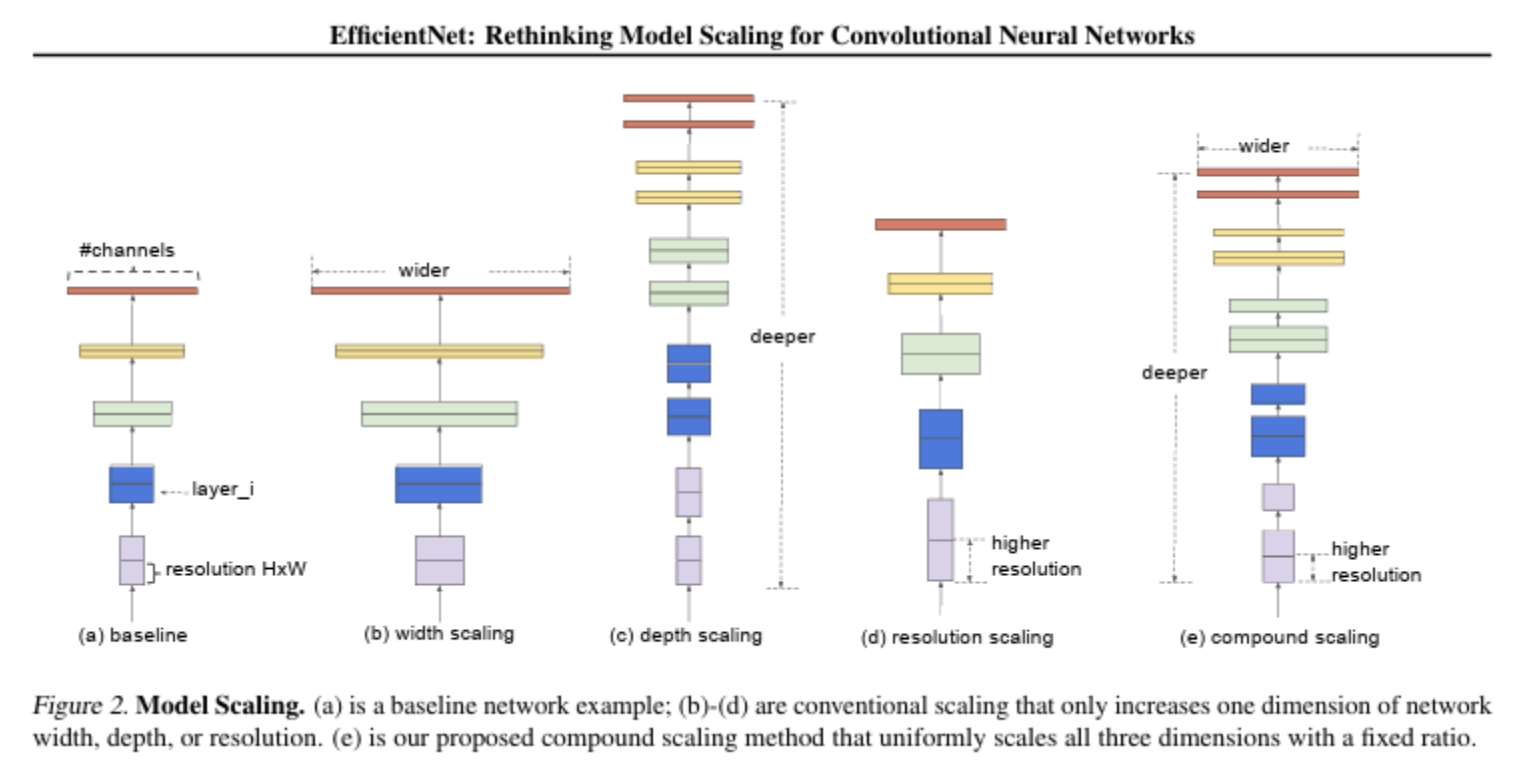
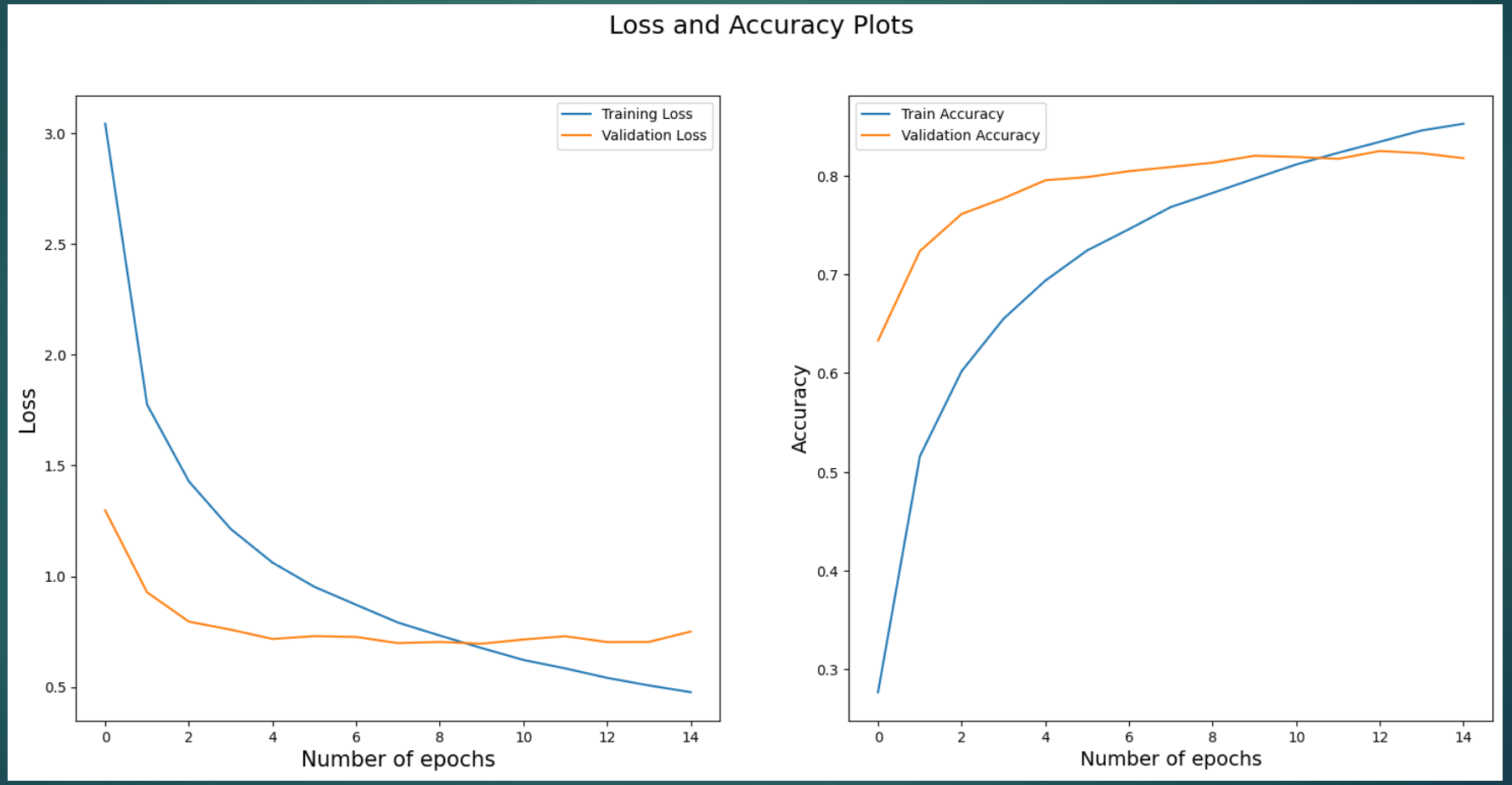


Figure 2. **Model Scaling.** (a) is a baseline network example; (b)-(d) are conventional scaling that only increases one dimension of network width, depth, or resolution. (e) is our proposed compound scaling method that uniformly scales all three dimensions with a fixed ratio.

It was empirically observed that different scaling dimensions are not independent. Intuitively, "If the input image is bigger, then the network needs more layers to increase the receptive field and more channels to capture more fin-grained patterns on the bigger image"

Assignment 1 – Final Model

Image classification on the CIFAR-100 dataset



Validation Accuracy: 84.5%

Test Accuracy: 83.93%

Project Overview

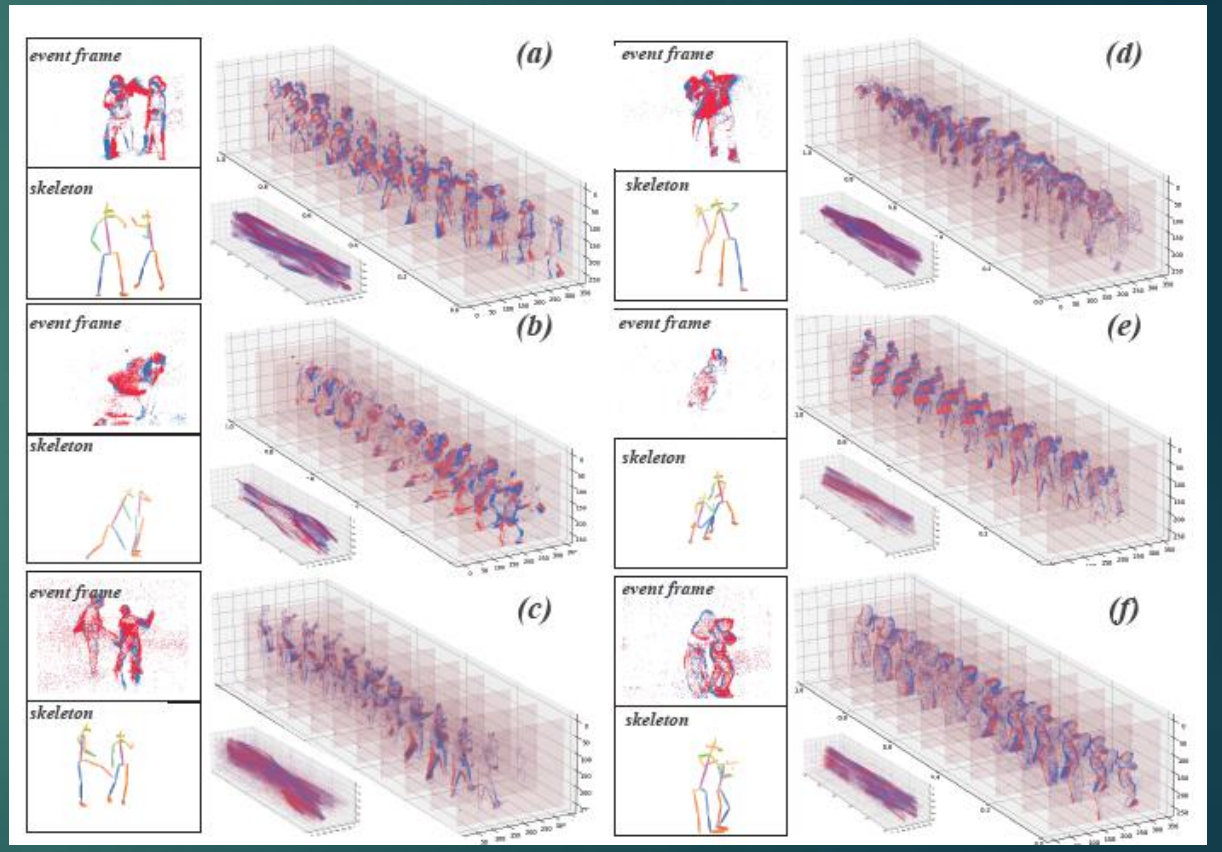
- Project Team: Dr. Yogesh Rawat
- Real-Time Detection of School Bullying Using CCTV
- The project focuses on using deep learning and video activity recognition models to detect bullying behaviors in real time from school surveillance footage.

Problem

- Existing surveillance systems in schools are passive and rely on human monitoring, which is inefficient and prone to oversight.
- There is a lack of robust, real-time systems that can detect aggressive or bullying behaviors using visual input from CCTV cameras.
- Moreover, there is limited publicly available data tailored to the school bullying context, especially in natural school environments.

Bullying10K dataset





Plan of Action

- Step 1: Look for existing bullying-related video datasets (e.g., Bullying10K, UCF-Crime)
- Step 2: Decide on behavior classes for open-vocab detection
  - Define a list of specific bullying actions (e.g., shoving, punching, group intimidation)
- Step 3: Curate and organize datasets
  - Collect clips that match these behaviors using manual filtering
- Test zero-shot models
  - Evaluate model performance without retraining

UCF-Crime dataset

- 13 realistic anomalies including Abuse, Arrest, Arson, Assault, Road Accident, Burglary, Explosion, Fighting, Robbery, Shooting, Stealing, Shoplifting, and Vandalism.



RWF-2000 dataset

- 2000 clips and 300,000 frames data set for real-world violent behavior detection under surveillance camera.



XD-Violence

- a large-scale and multi-scene dataset named XD-Violence with a total duration of 217 hours, containing 4754 untrimmed videos with audio signals and weak labels.



Next Steps

- Step 2: Decide on behavior classes for open-vocab detection
  - Define a list of specific bullying actions (e.g., shoving, punching, group intimidation)
- Step 3: Curate and organize datasets
  - Collect clips that match these behaviors using search phrases, annotations, or manual filtering
- Test zero-shot models
  - Evaluate model performance without retraining