MLEng **Final Project**: End-to-End System Integration

Highlight Reel

1 Objectives

By completing the final project you will:

- Create a well-structured program that organizes each pipeline stage (feature engineering → classification → post-processing → highlight extraction) into separate classes, with a single main entry point.

- Demonstrate rigorous experimentation and decision making, documented as a development journey in `README.md`.

- Communicate your design choices and findings in a short oral presentation.

2 Project Requirements

2.1 1. Integrated Codebase

a) Create a main script (e.g. `main.py`) that can be run with command line arguments:

```
1  python main.py \
2      --tracking_csv data/tracking.csv \
3      --video_raw  data/source.mp4 \
4      --output_dir outputs/
```

b) Structure your code using separate classes for each component of the pipeline:

- **FeatureEngineer**
- **Classifier**
- **OutputFilter**
- **HighlightMaker**

c) Supply an `environment.yaml` (or `requirements.txt`) and clear instructions in the README so that cloning the repo and following the steps reproduces your final results *without modification*.

2.2 2. Development Journey in `README.md`

- Initial approach and baseline implementation
- Key challenges encountered
- Experiments and iterations (with plots/visualizations)
- Decision points and reasoning
- Performance improvements over time
- **Final Results**: what worked best (with metrics and example highlights)
- **Learnings & Next Steps**: what we learned, what surprised us, and ideas for future improvements

Graphs should be embedded as images in the repo (no external links).

2.3 3. Live Presentation

- Architecture diagram of your integrated system.
- Two or three design decisions you found most impactful (*why* and *evidence*).
- A 30 to 60 s exceprt of your highlight reel showcasing the result of an improvement you made.
- Any unexpected or fun insights discovered along the way.

Presentation order will be drawn at random at the start of the workshop.

3 Submission Checklist

- Push committed code, README, environment file(s), precomputed assets, and slides to your private GitHub repository shared with `https://github.com/paulkefer`.

- Verify the pipeline runs from a clean clone using only the README.

- Join the next workshop with presentation ready.

Git history will be frozen when the workshop begins; late pushes will be ignored.

4 Deadline

Next workshop. The repository will be cloned *at the beginning* of the session; presentations follow immediately after.