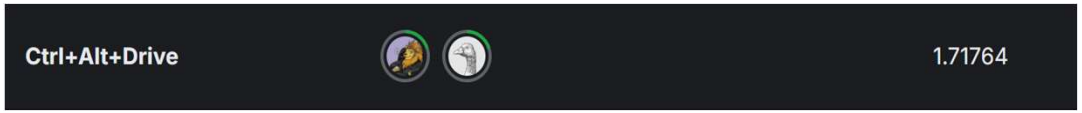
DLAV Project :
End to End Deep Learning Planner for an Autonomous Vehicle

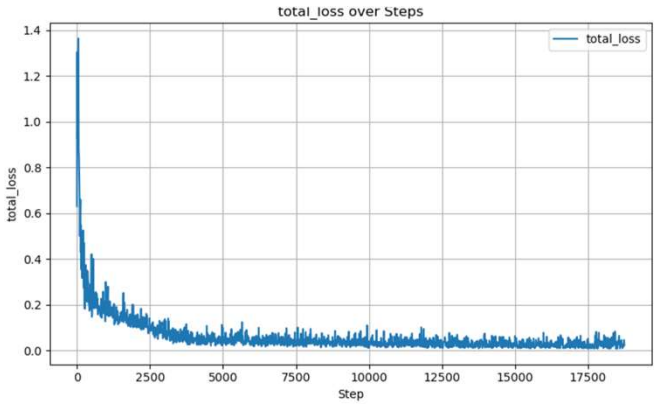
Ctrl-Alt-Drive Team
Victor Labbe – Sylvain Beuret

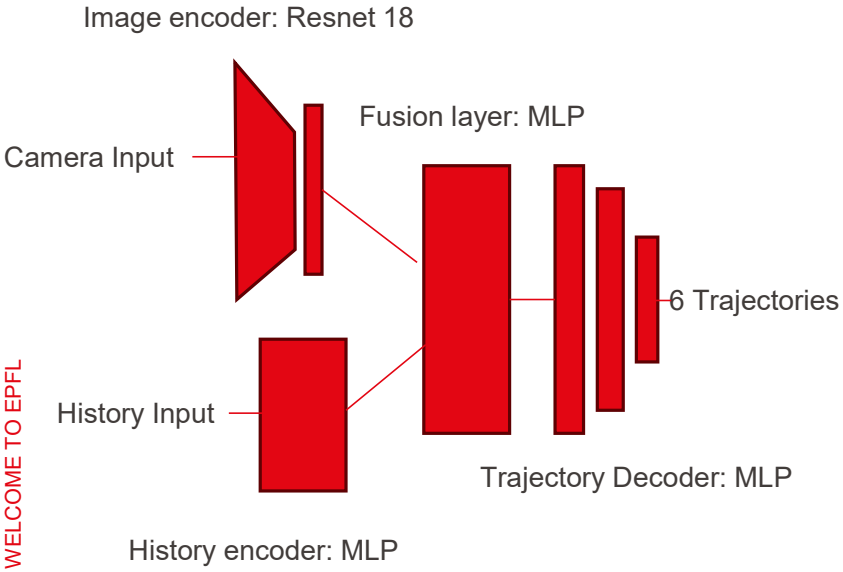
Milestone I

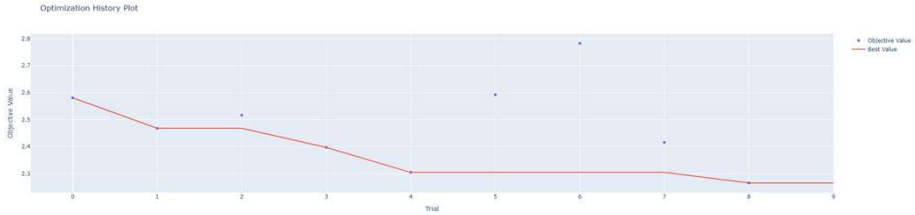


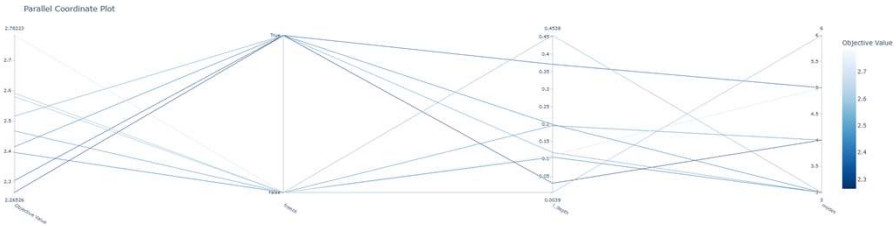
What we implemented :

- Good logger to plot our losses
- Trainer with GradScaler – L1Smooth Loss
- Hyperparameter Tuning with Optuna
- Our multi-modal output model









Unsuccessful Tries :

- Transformers
- LSTM - GRU

Milestone II

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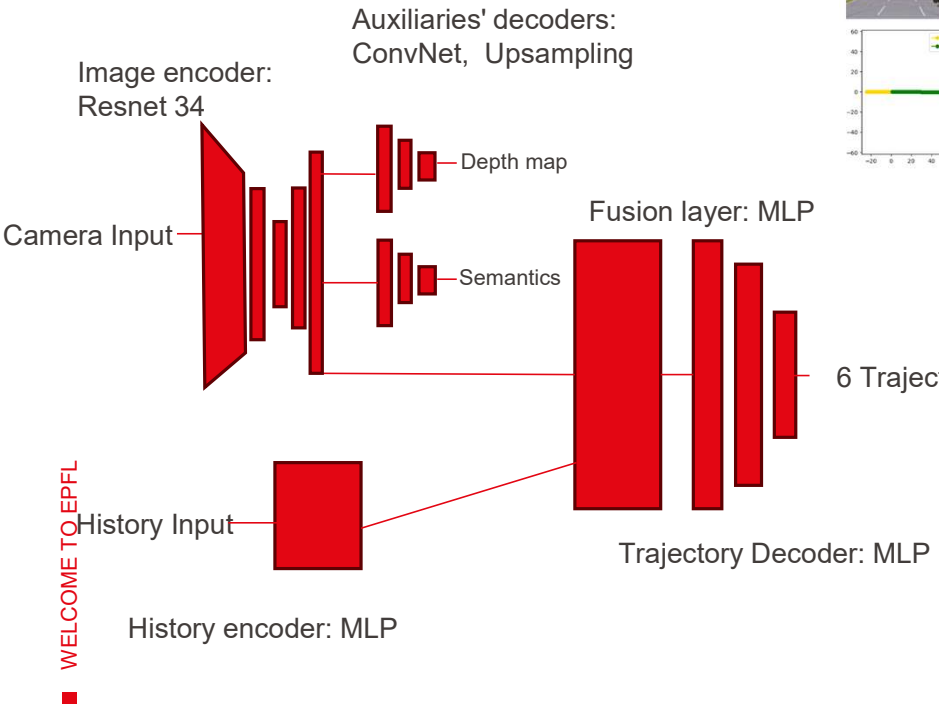
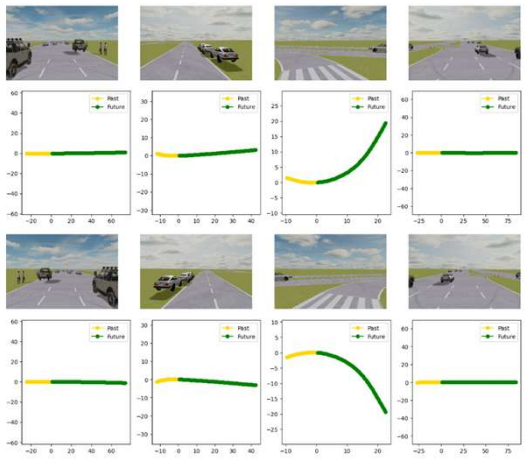
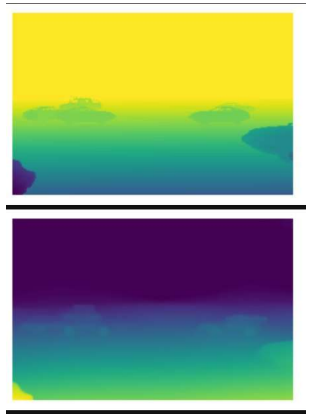
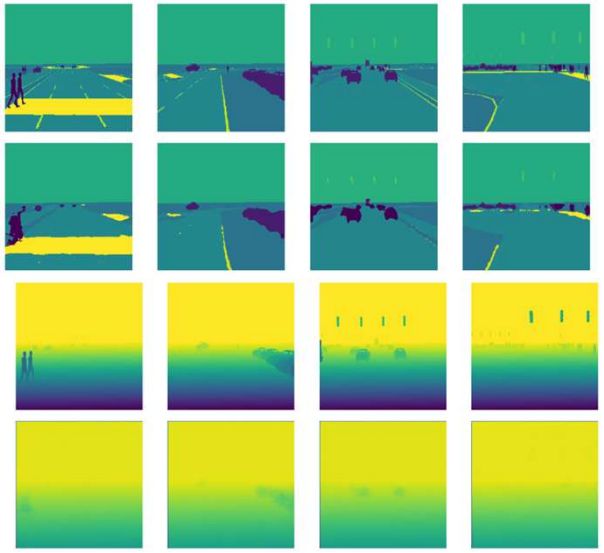
What we implemented :

- Depth & Semantic Heads
- Data Augmentation
- Freezing part of the pretrained Visual encoder









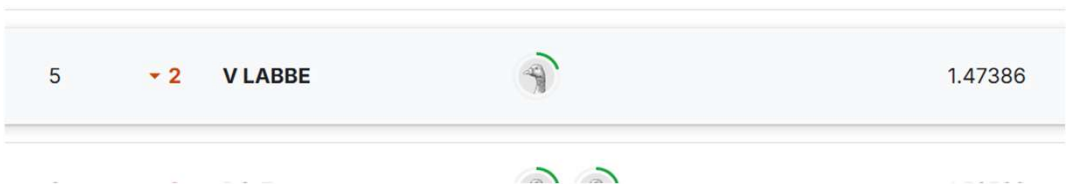
Unsuccessful Tries :

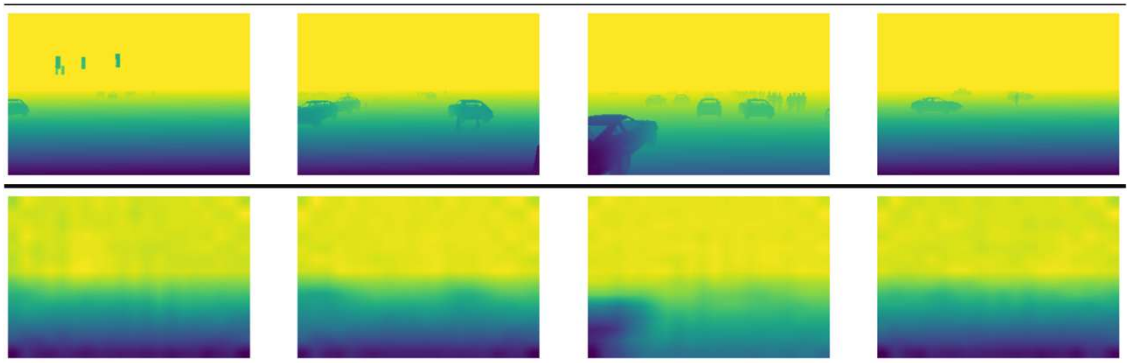
- Deeper Networks
- Midas
- U-net architecture
- Enhanced Fusion with depth and semantics
- Transformers and GRU

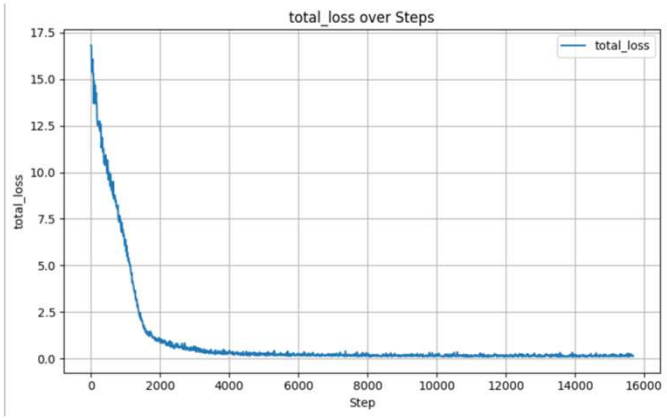
Milestone II

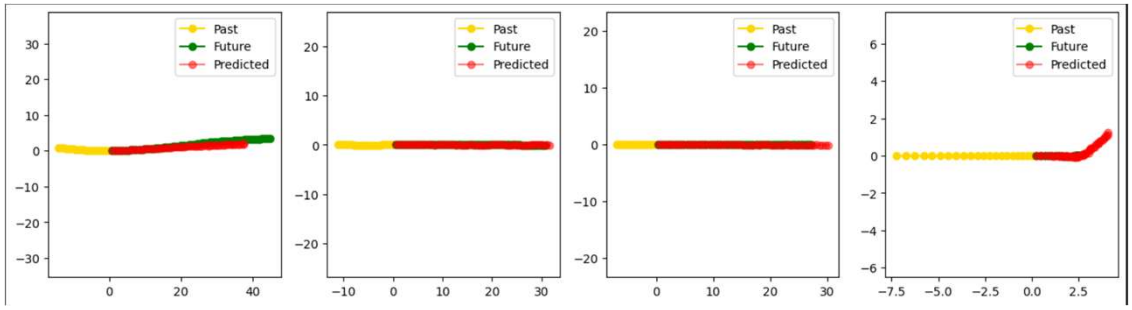
Best architecture:

- Less layers
- Depth estimation with CNN
  - Not used in the fusion
- No semantic segmentation
- Dropout
- Layernorm
- Data augmentation
- Hyperparameters tuning with optuna









Milestone III

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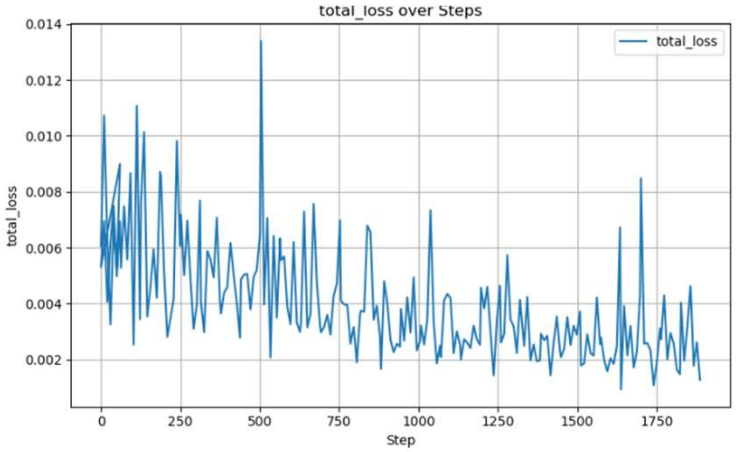
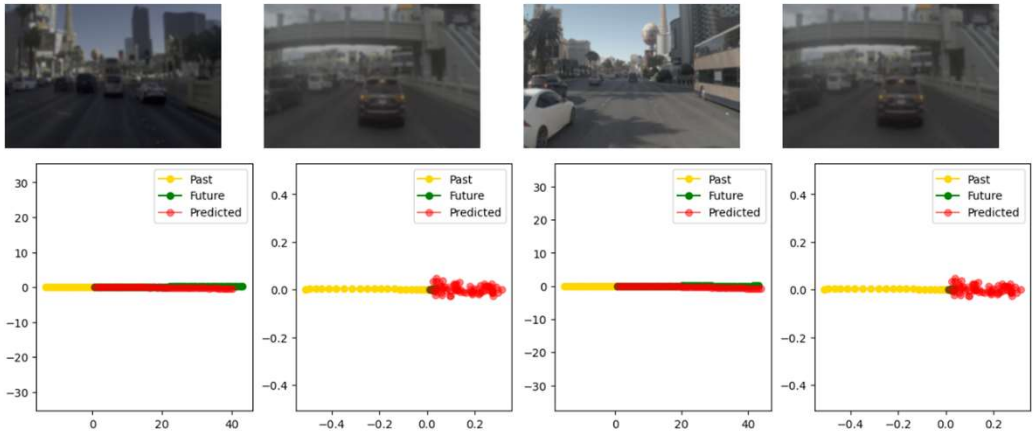
What we implemented :

- Retraining on previous best models
- Some more Data augmentation
- Adjusting the Dataset Mixture





Unsuccessful Tries :

→ Worked well right away with proper augmentation !

Pretrained Resnet must have helped