# Timeseries segmentation feedback

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# Outline

1. Context
2. Unsupervised learning – State Detection
3. Unsupervised learning – Change Point Detection
4. Supervised learning
5. Conclusion

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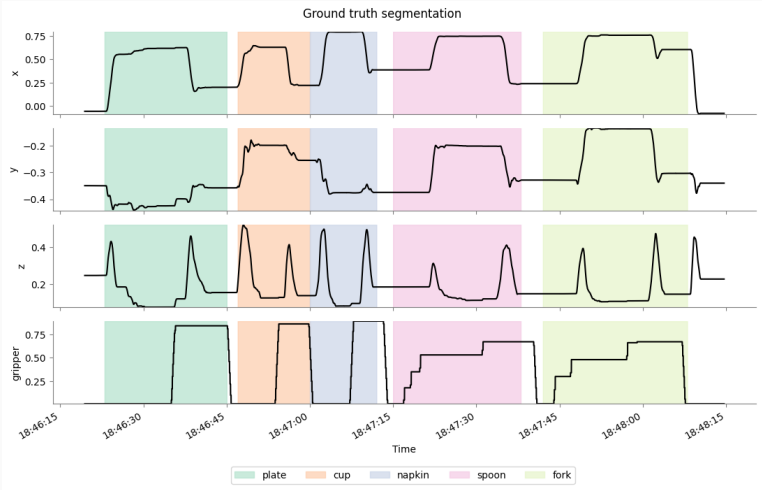
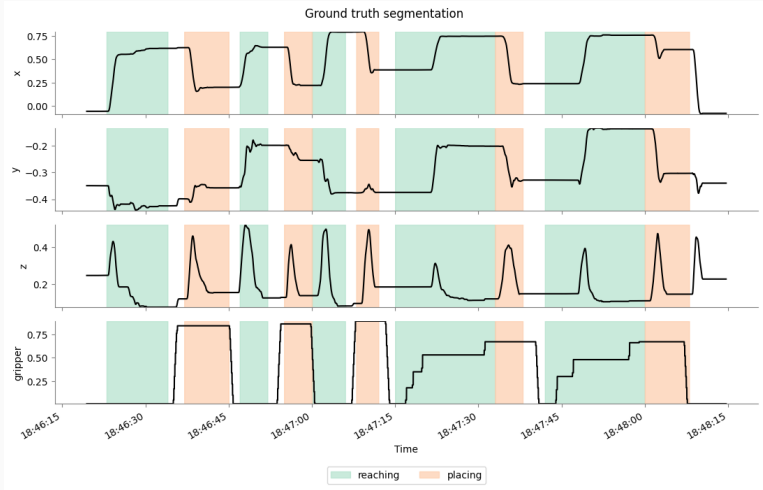
# Robot learning of long horizon demonstrations

Video! TODO




→ Small data *i.e.*, few demonstrations

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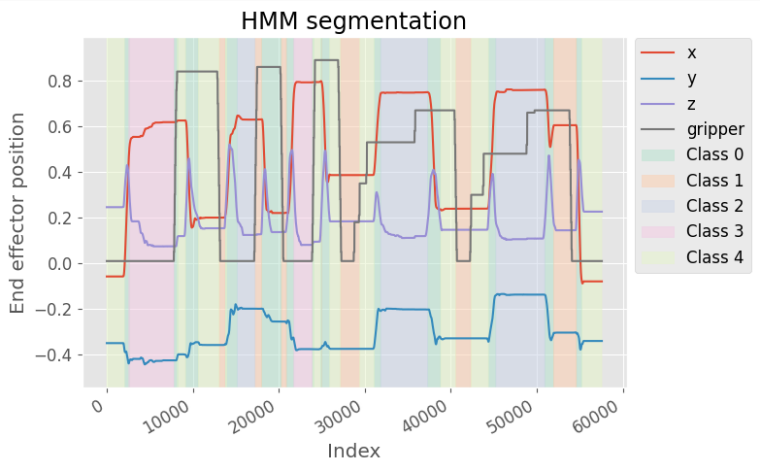
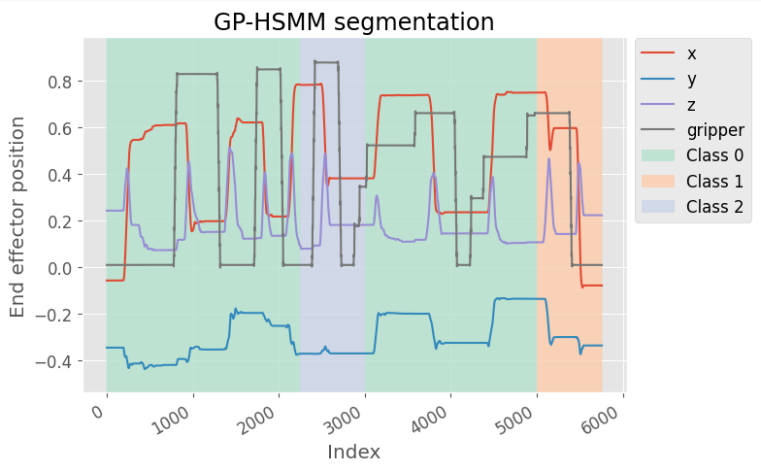
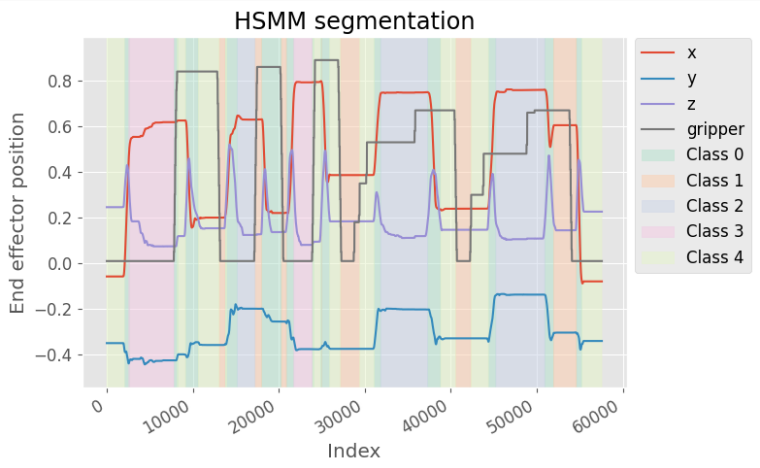
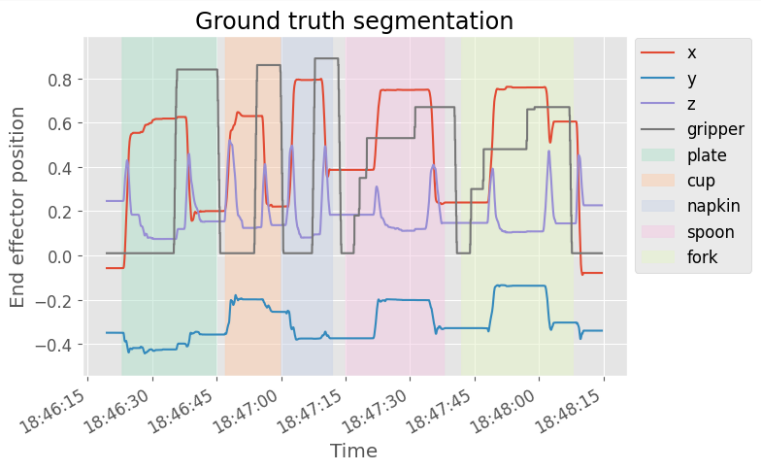
# H(S)MM – Higher level movements ✖



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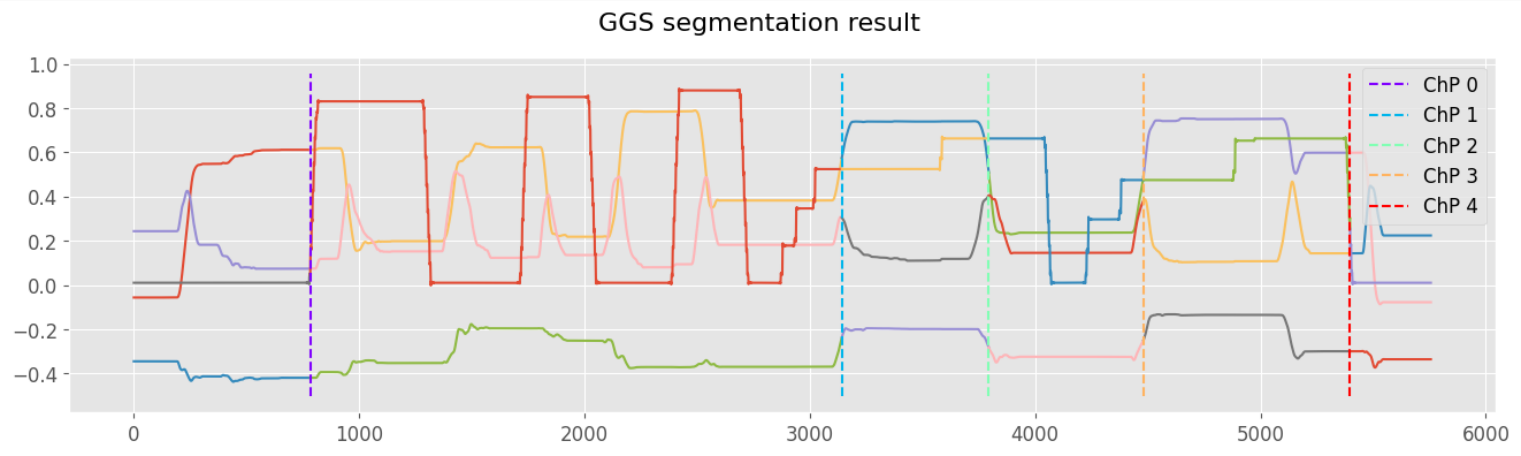
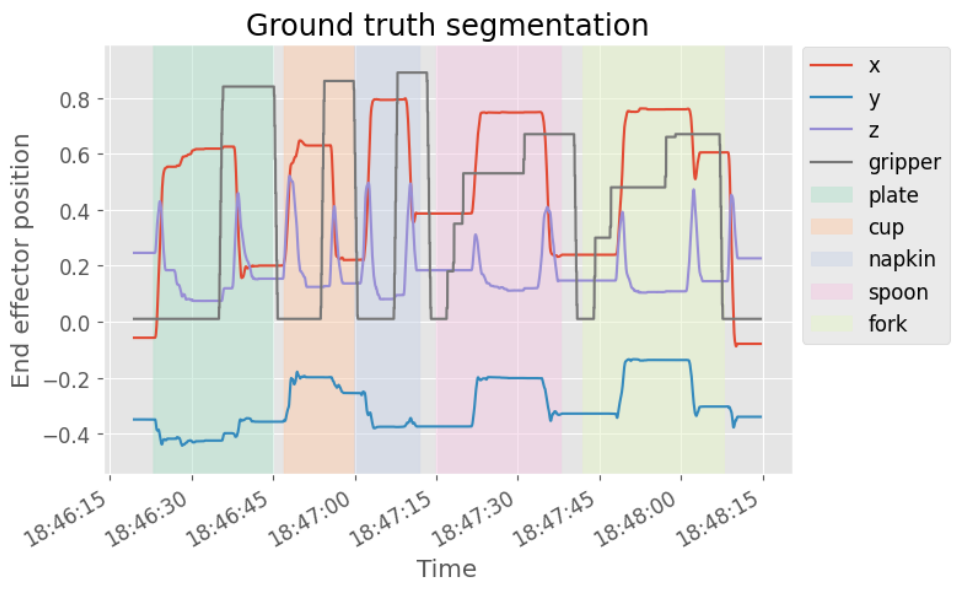
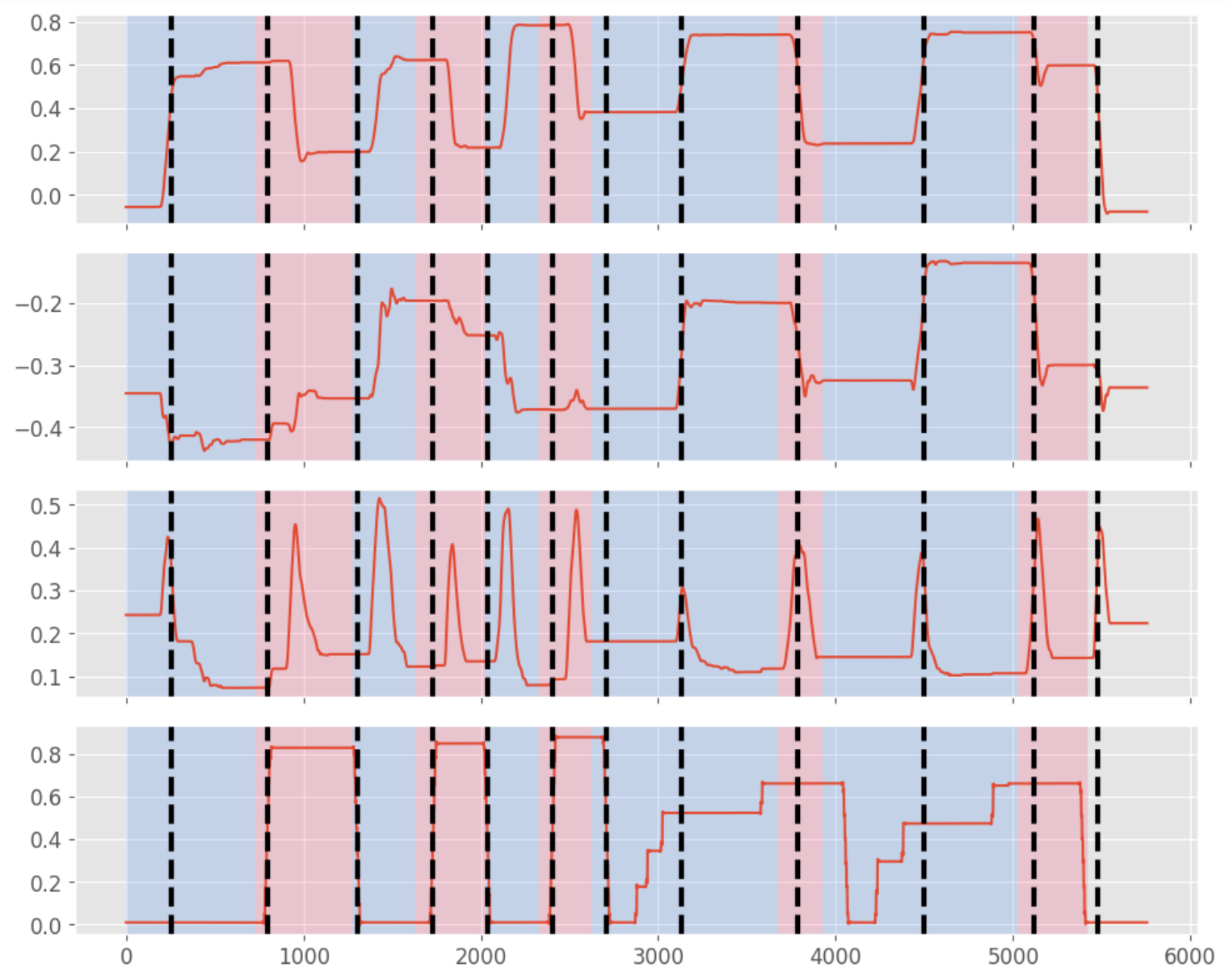
# Greedy Gaussian Segmentation – Higher level movements ✖



# ruptures – Lower level movements



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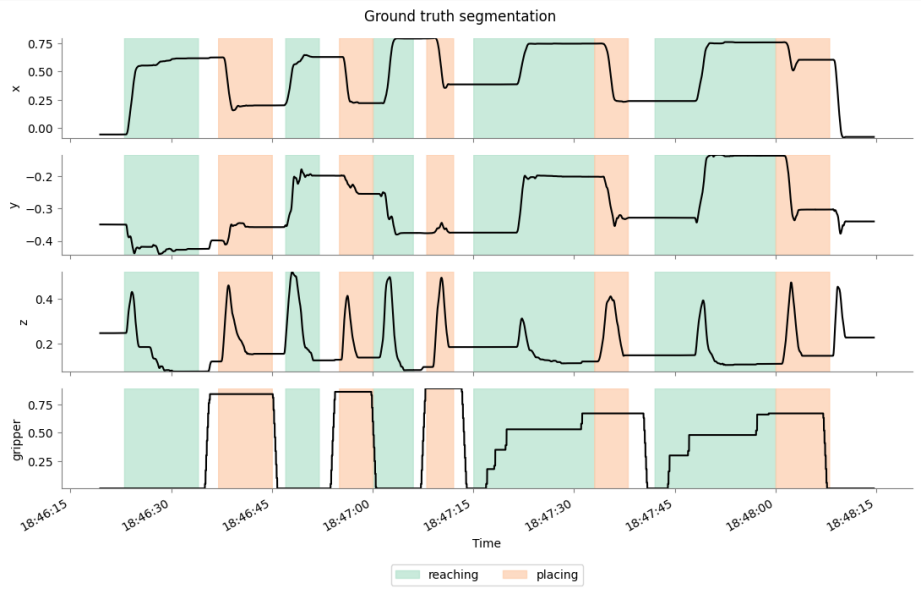
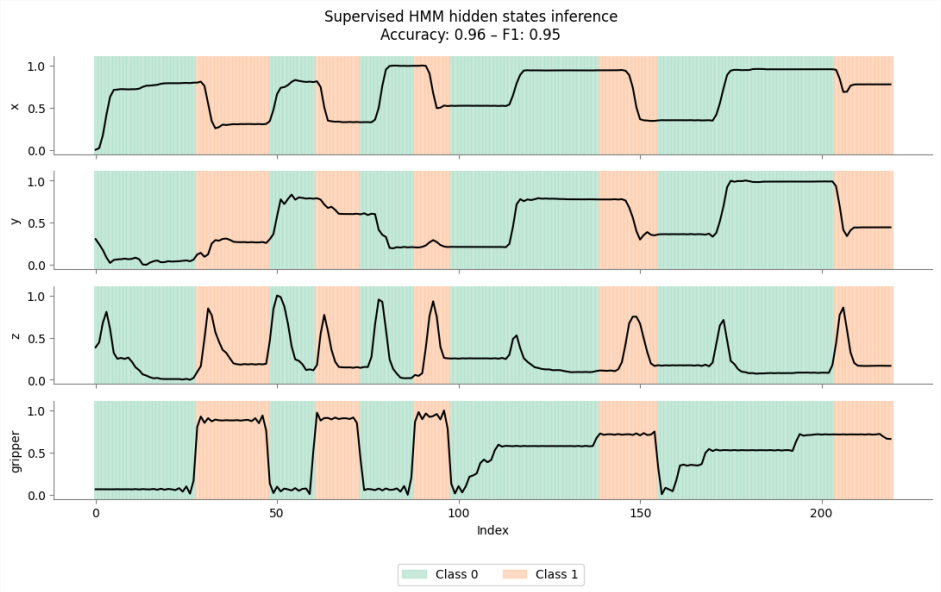
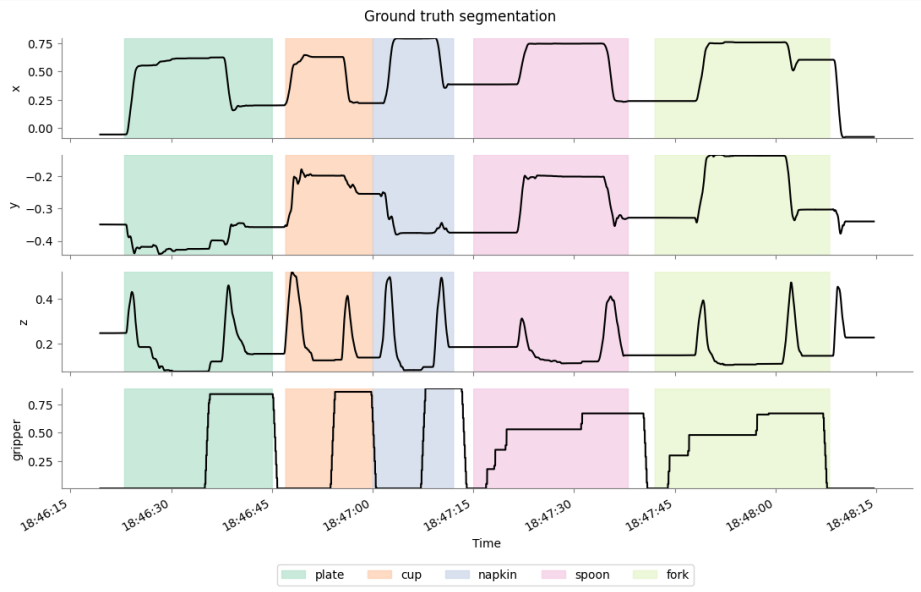
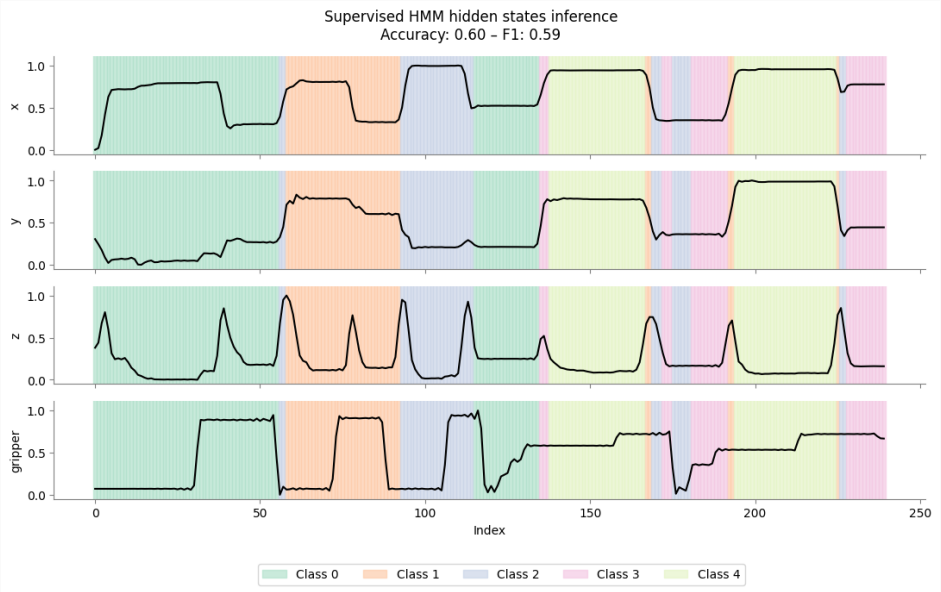
# Supervised HMM – Lower level movements



# Supervised HMM – Higher level movements ✖



# XGBoost – Higher level movements ✖

| Split | F1 | Accuracy |
|---|---|---|
| 1 | 0.2722 | 0.3741 |
| 2 | 0.1639 | 0.1872 |
| 3 | 0.1684 | 0.3381 |
| 4 | 0.1469 | 0.3501 |
| 5 | 0.1713 | 0.3458 |

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# Conclusion

- Can model lower level movements with good performance
- Modeling higher level movements remains a challenge

# Questions

- Any other method I may have missed that could help solve this problem?
  - Variational inference?
- How to integrate context, *e.g.*, video?
  - Multimodal transformer but probably too data hungry?

Questions ?