Vid2Param: Probabilistic Modelling of Dynamics Parameters from Video

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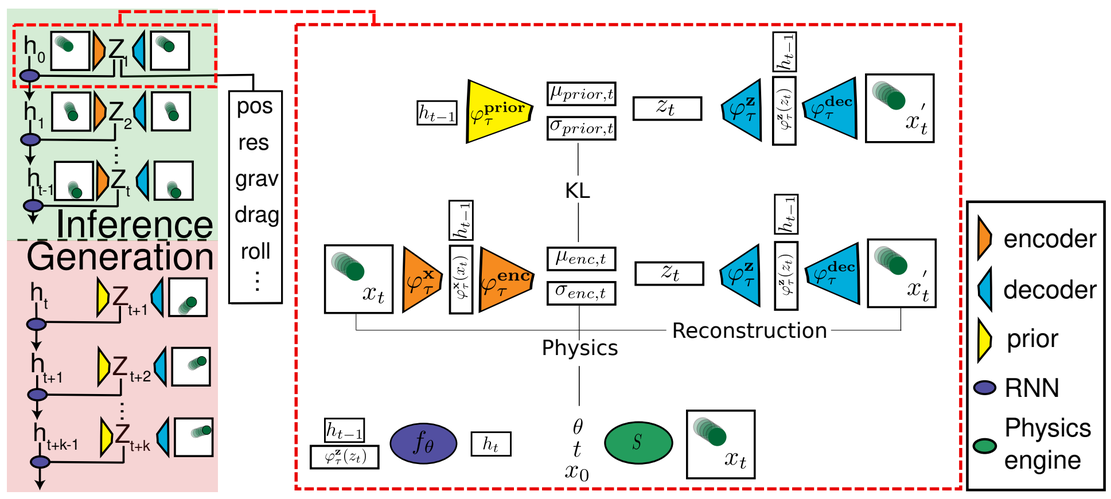
Introduction

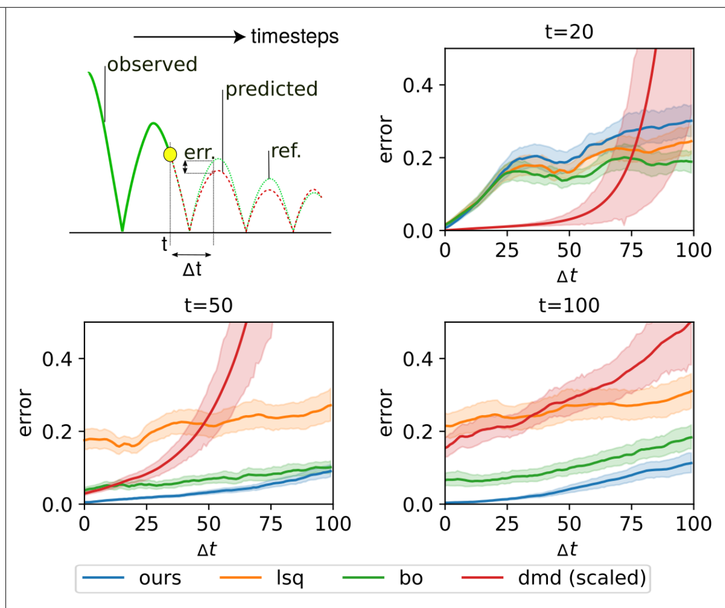
We are interested in reasoning about the **dynamics** in an environment, by using a **single video stream as a sensory input**.

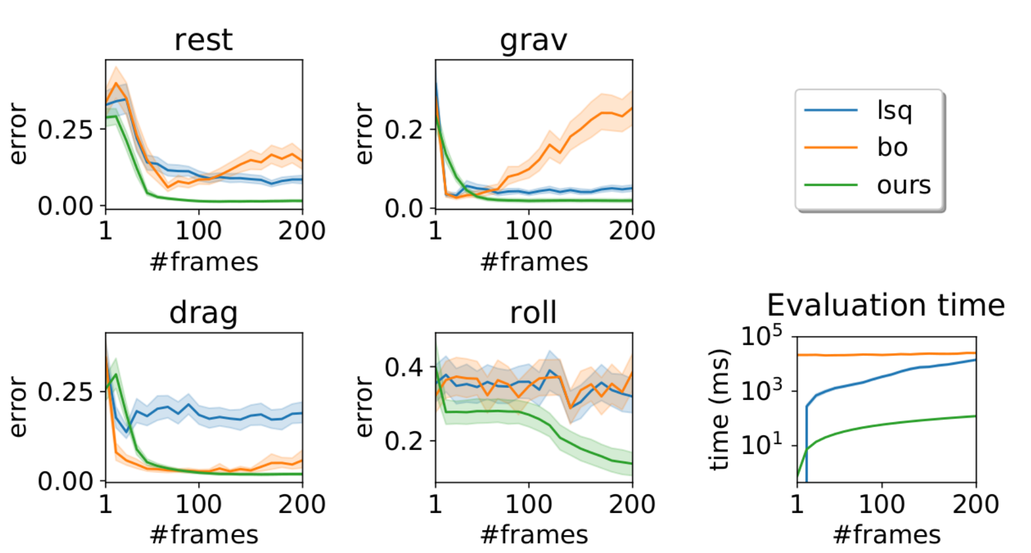
Methodology



Experiments & Results

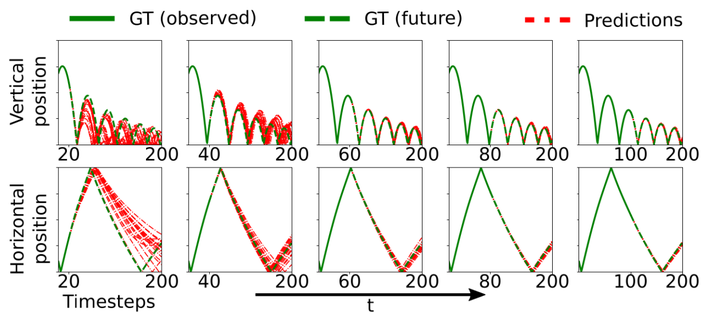
Forward predictions



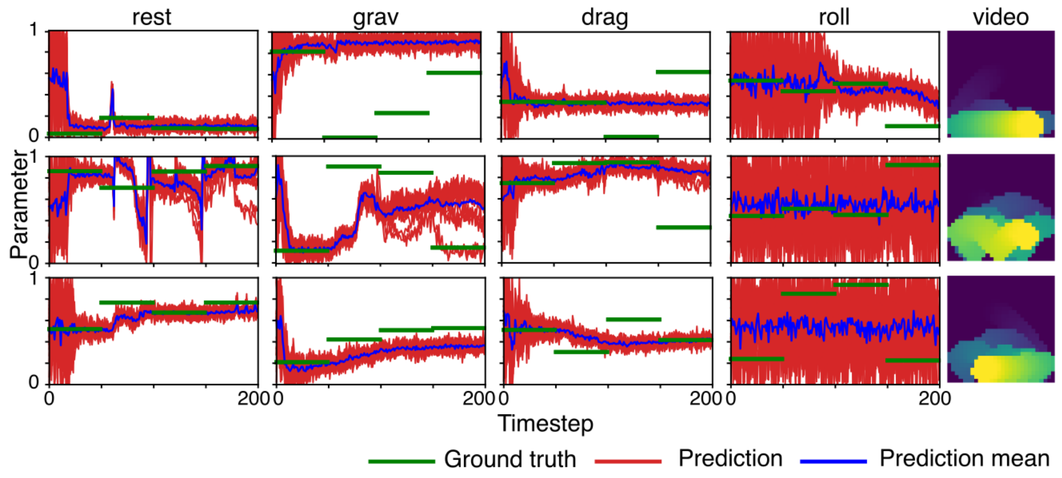


System identification

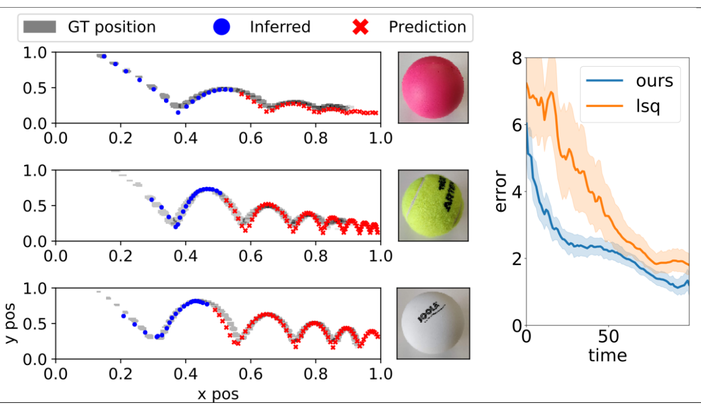
Forward predictions uncertainty



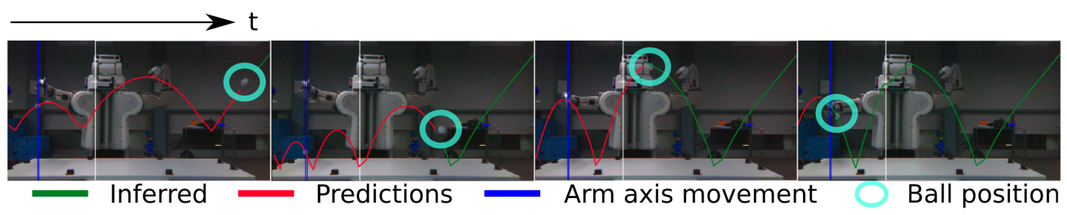
Varying physical parameters



Real videos



Robot experiments



Random Policy	8/35 (23%)
Random Policy (2x)	10/35 (29%)
Vid2Param	**27/35 (77%)**

Conclusion

- Identification of multiple entagled physical parameters is challenging -> **Our method can perform accurate hybrid system identification**
- Accumulation of error in forward predictions -> **We outperform traditional baselines**
- Uncertainty estimates -> **Detecting varying physical parameters and their associated uncertainty**
- Sim to Real gap -> **Our method scales well to real videos**
- Speed challenges in robotics experiments -> **We are able to stop an uknown bouncing ball, even with occlusions present**

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