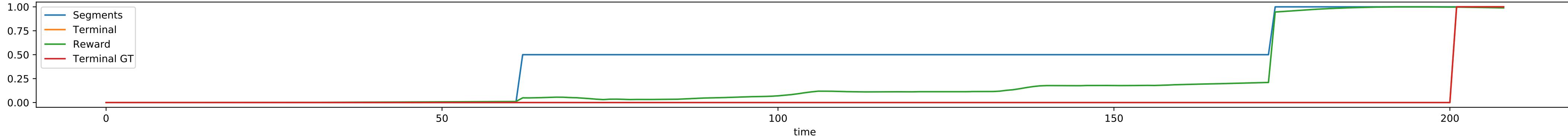
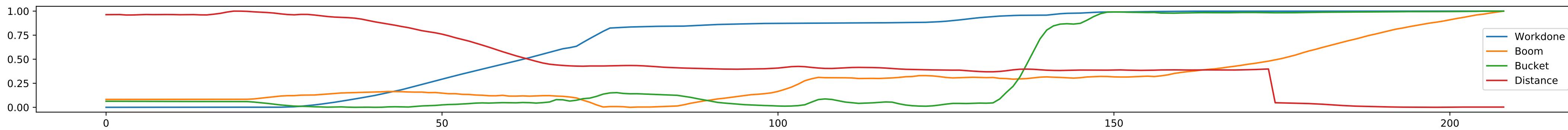
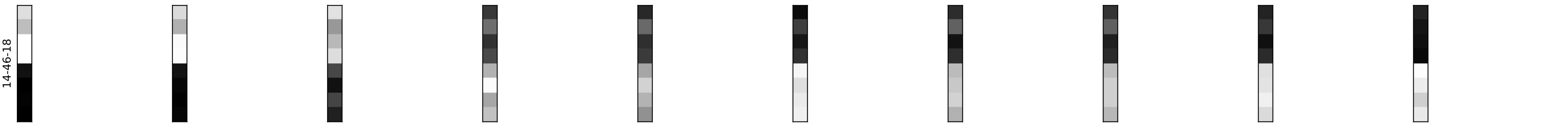
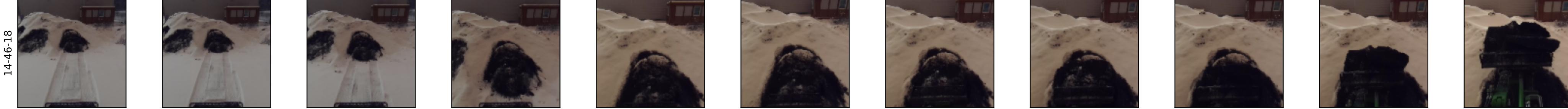


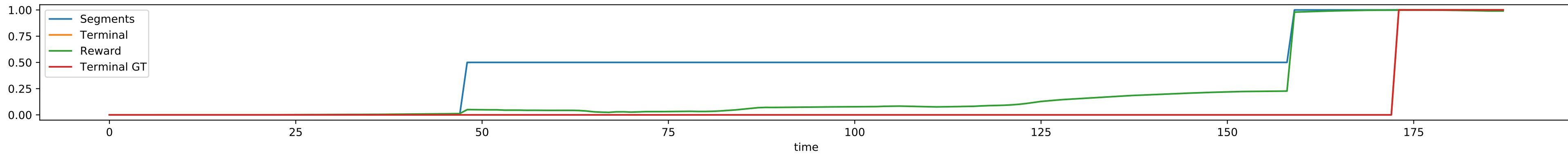
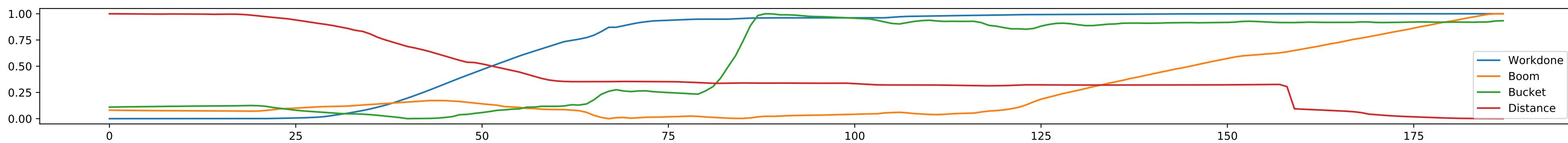
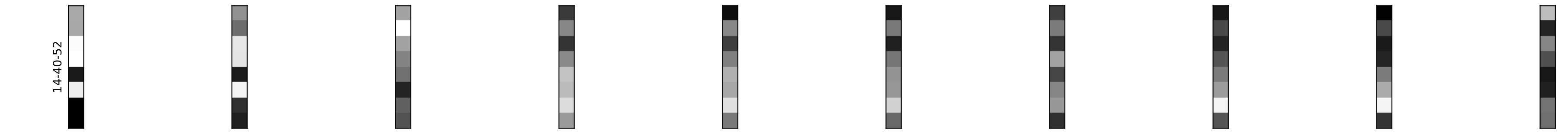
# Learning Reward from Demonstrations w/sensors (R<sub>max</sub> = 200)

Training Data		Sensor Values	Clustering & Classification	Reward
80 % of positive demos: mix of winter and autumn	Boom angle, Bucket angle, Distance to the pile, Segment, Reward	Difference R <sub>max</sub> and Distance to the next cluster center	K-means clustering and KNN Classifier	20 % of positive demos: mix of winter and autumn

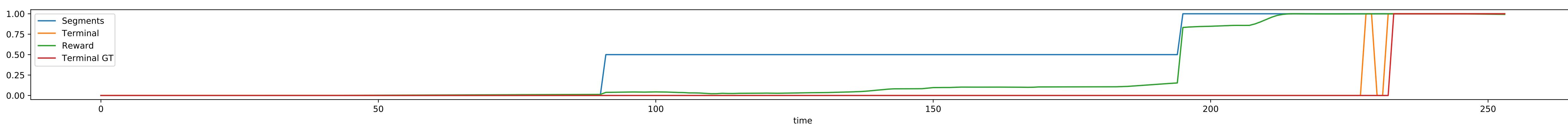
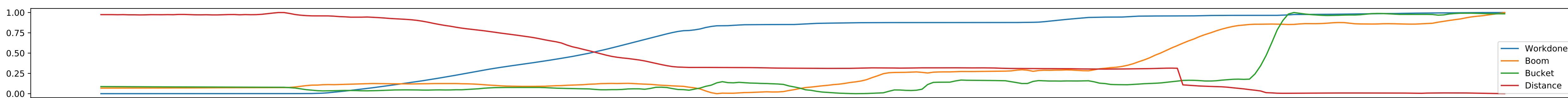
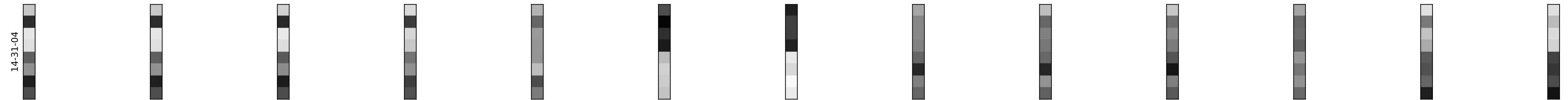
winter - 14-46-18



winter - 14-40-52

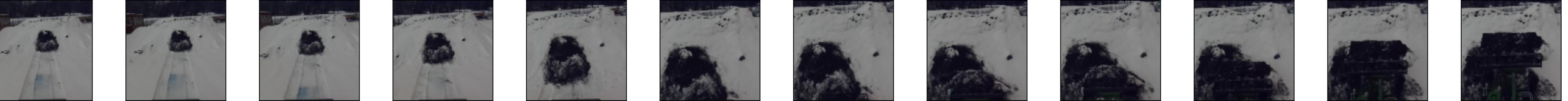


winter - 14-31-04

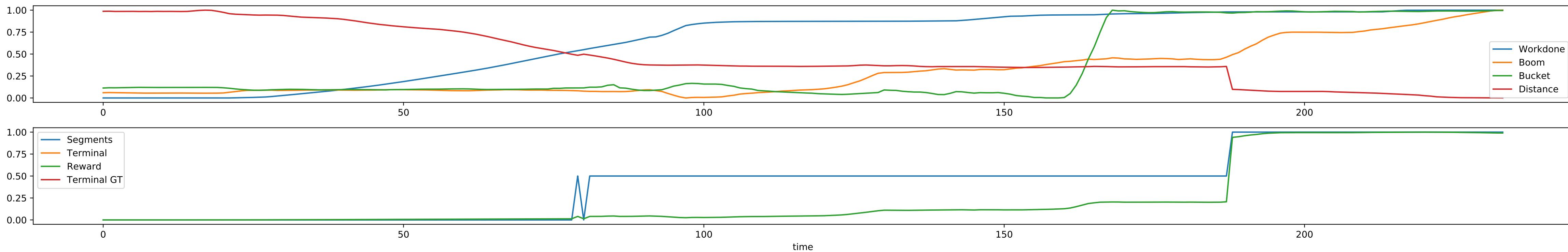


winter - 14-28-58

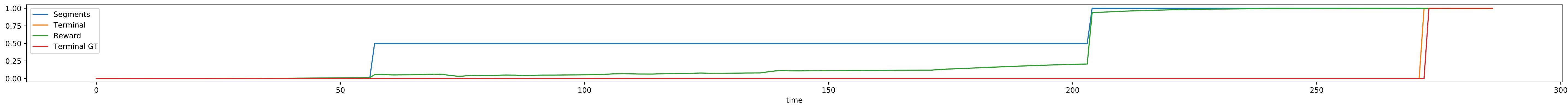
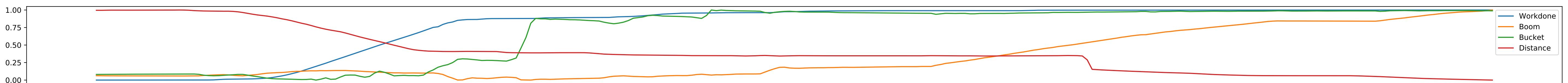
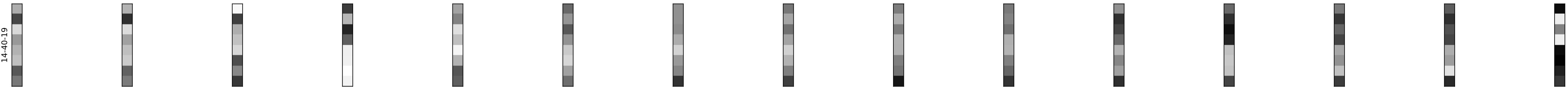
14-28-58



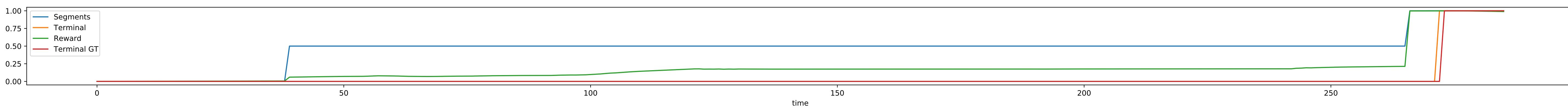
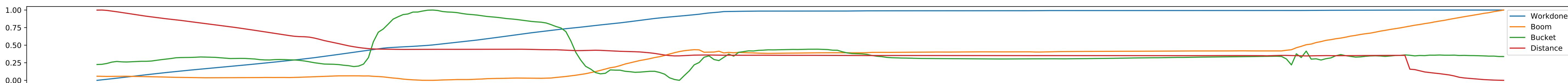
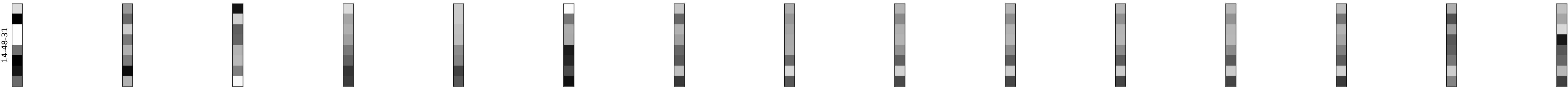
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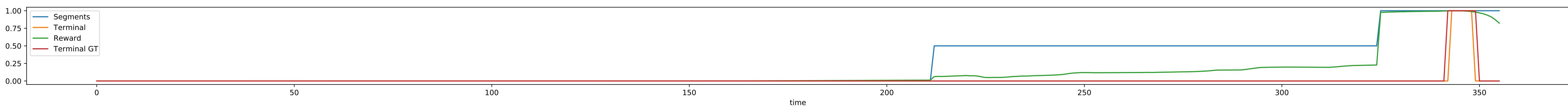
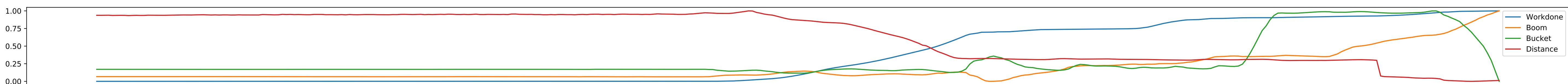
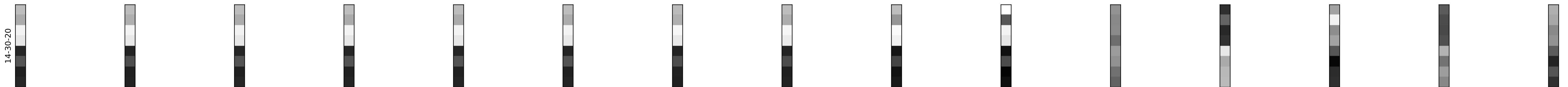
winter - 14-40-19



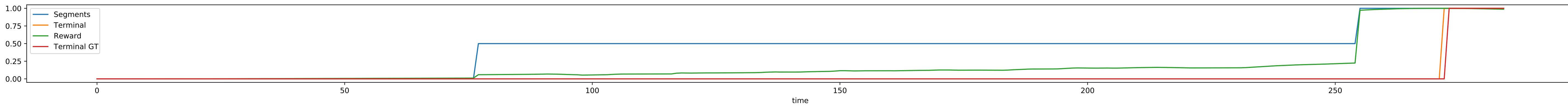
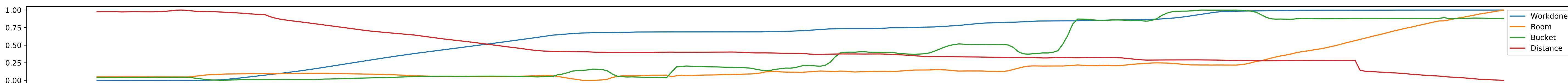
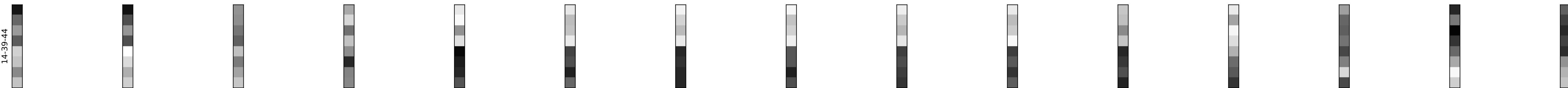
winter - 14-48-31

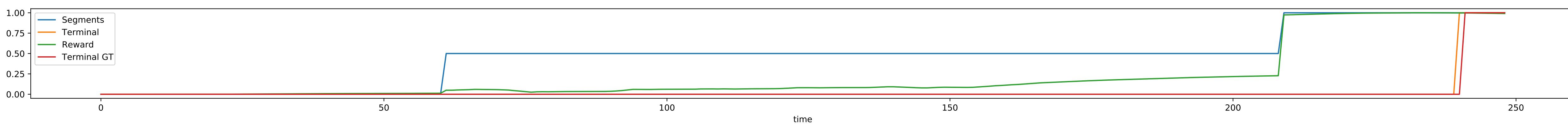
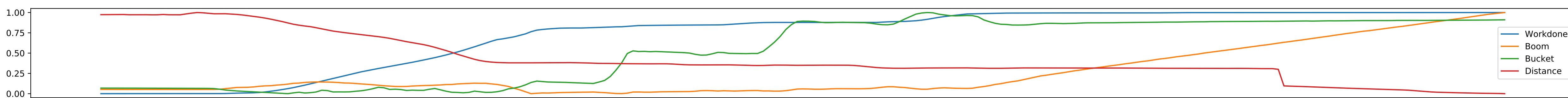
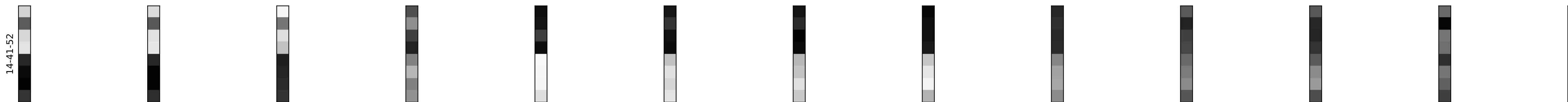
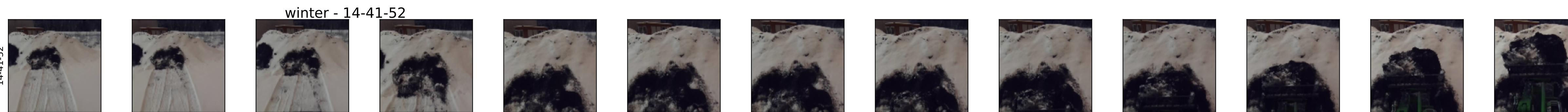


winter - 14-30-20

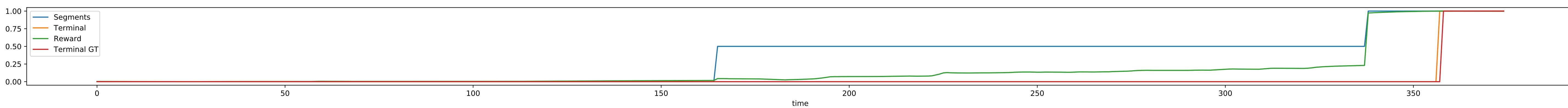
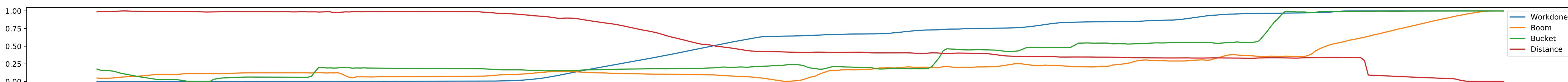
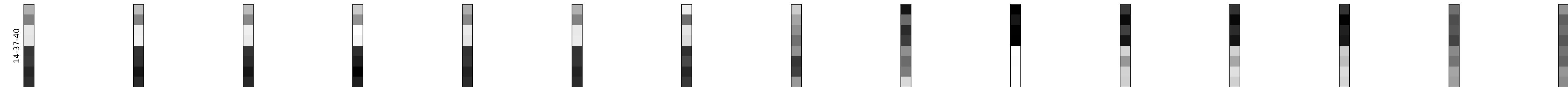


winter - 14-39-44

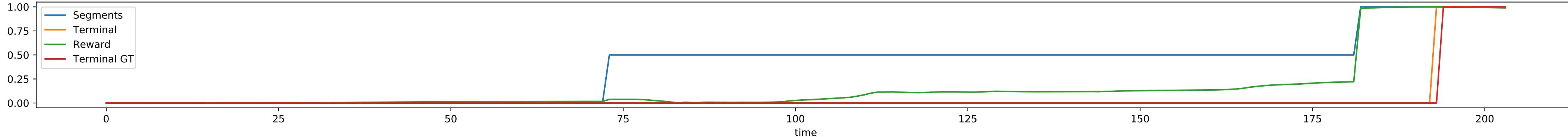
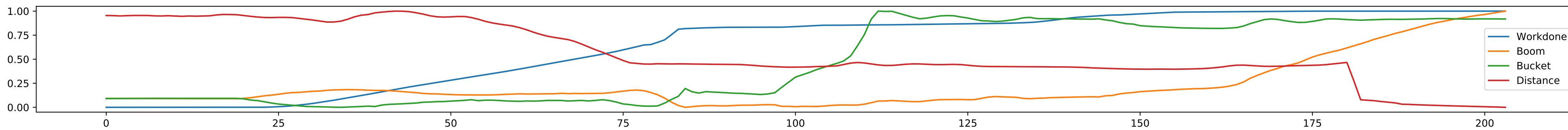
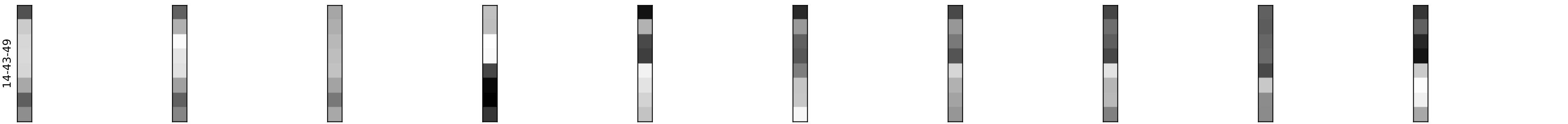




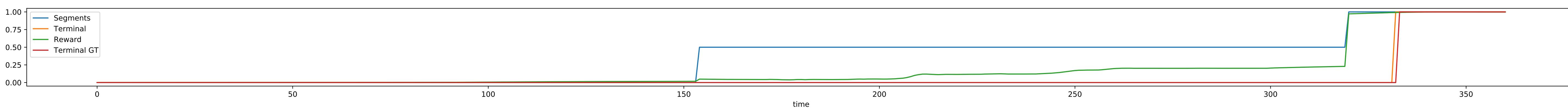
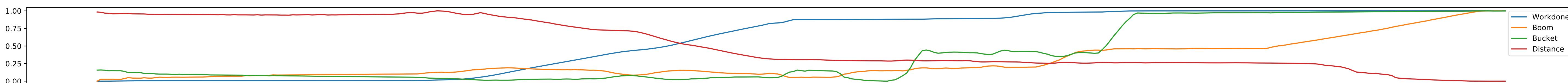
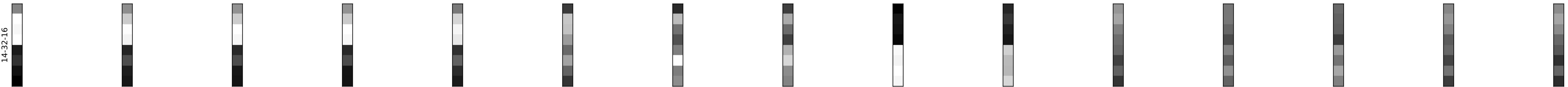
winter - 14-37-40



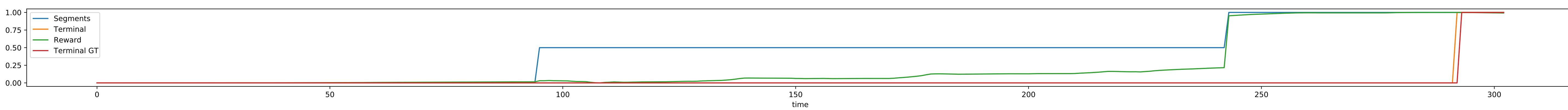
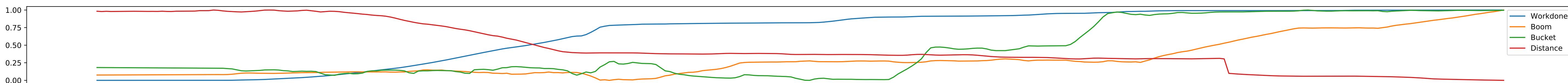
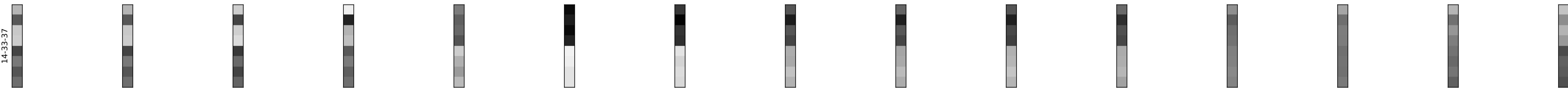
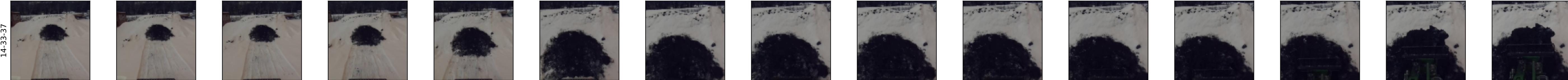
winter - 14-43-49



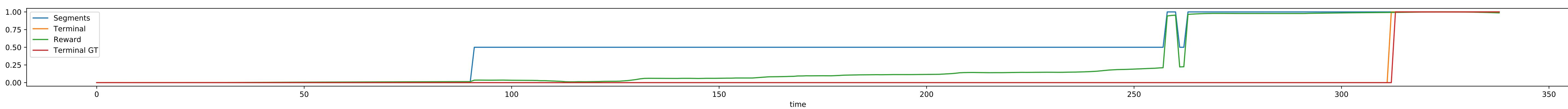
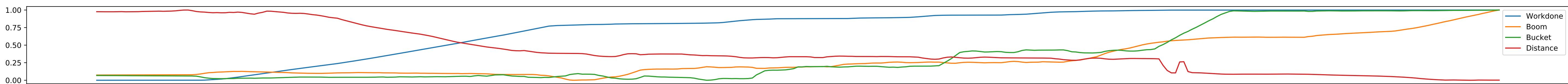
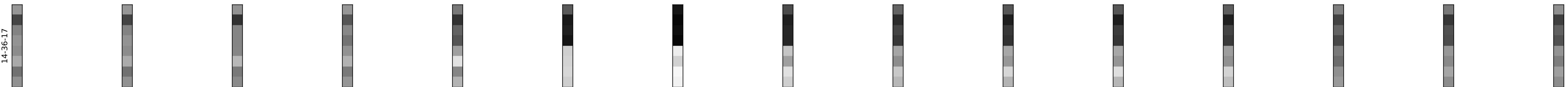
winter - 14-32-16



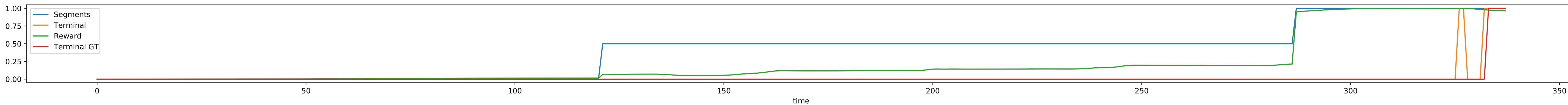
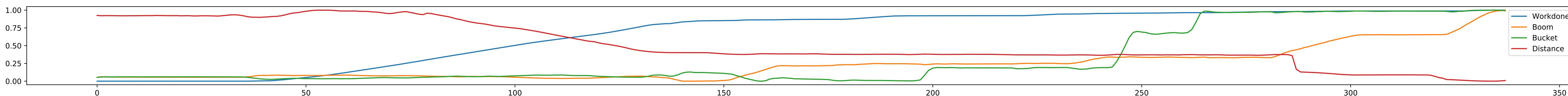
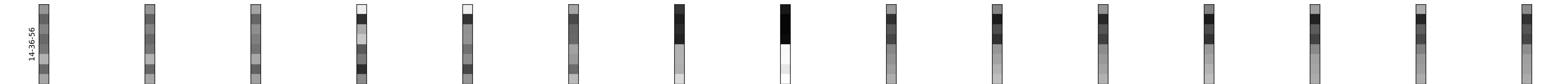
winter - 14-33-37



winter - 14-36-17



winter - 14-36-56

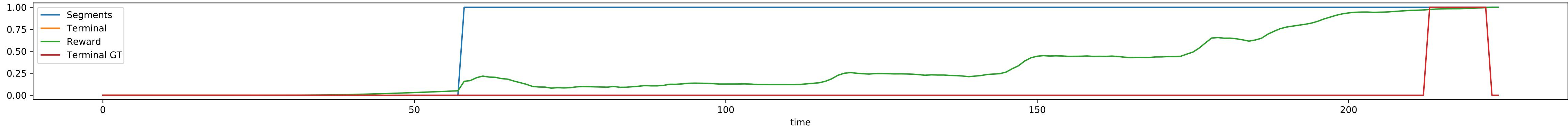
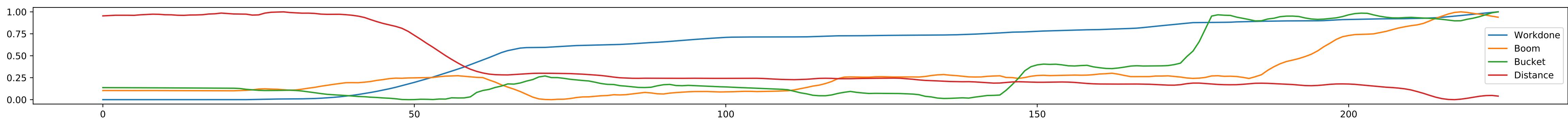
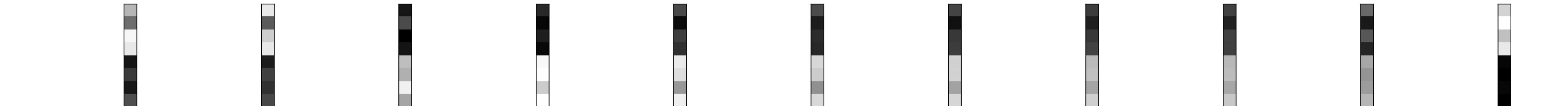


winter - 14-41-22

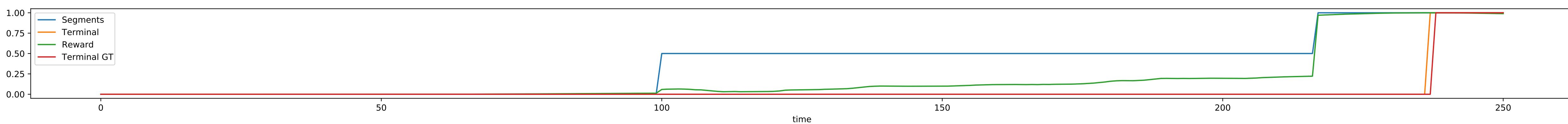
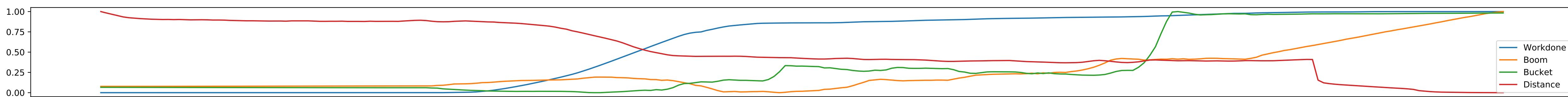
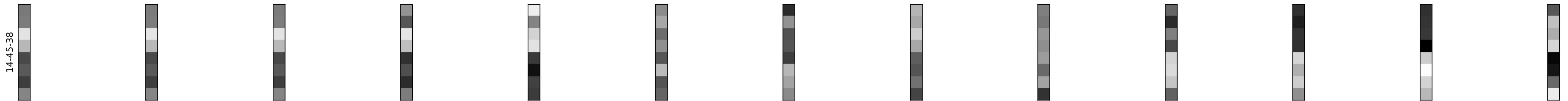
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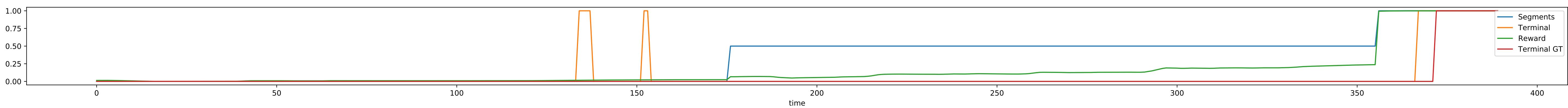
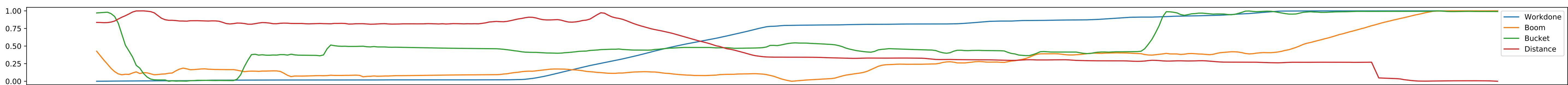
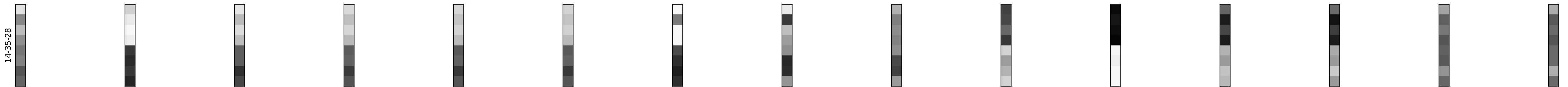
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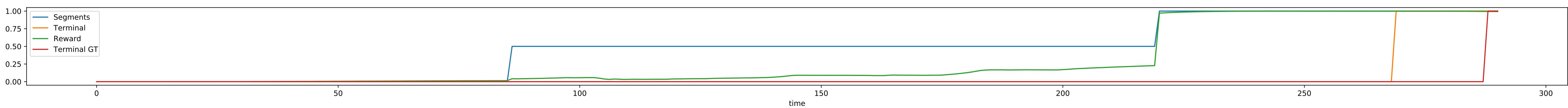
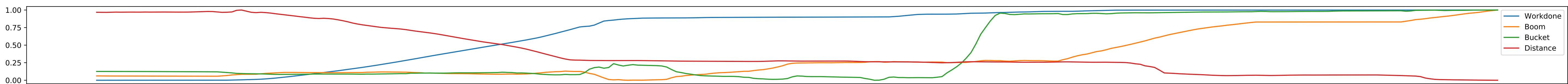
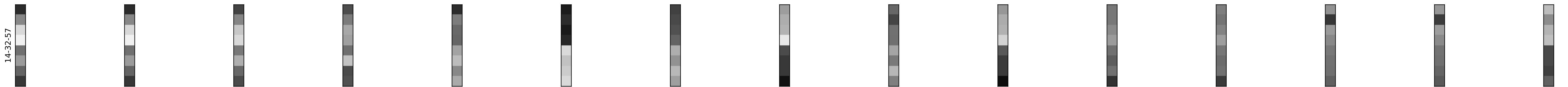
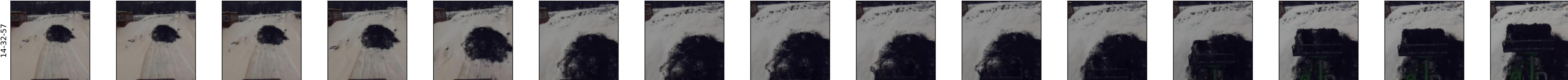
winter - 14-45-38



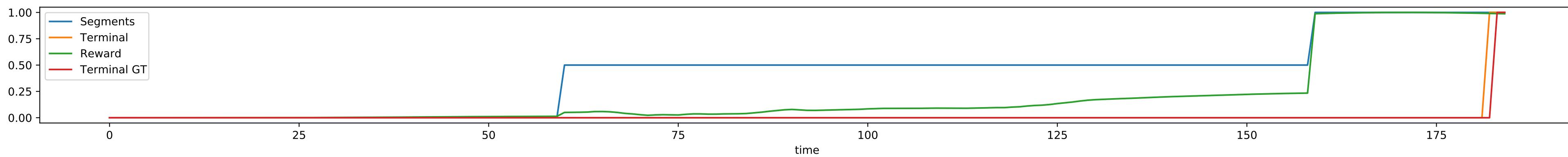
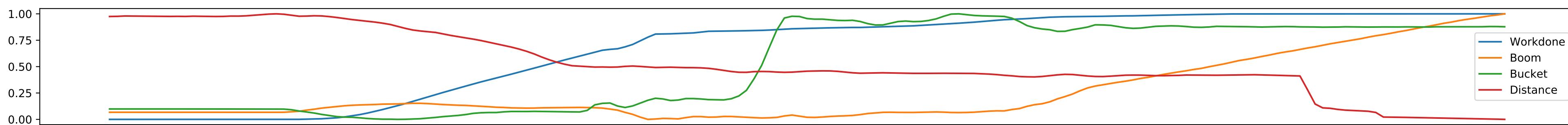
winter - 14-35-28



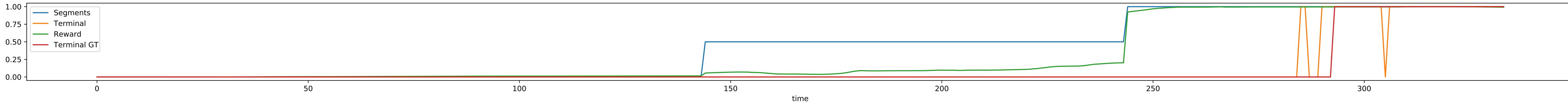
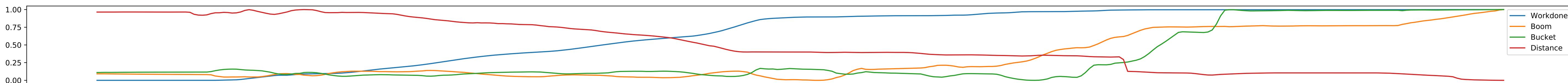
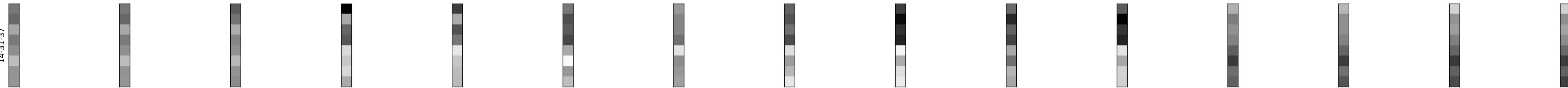
winter - 14-32-57



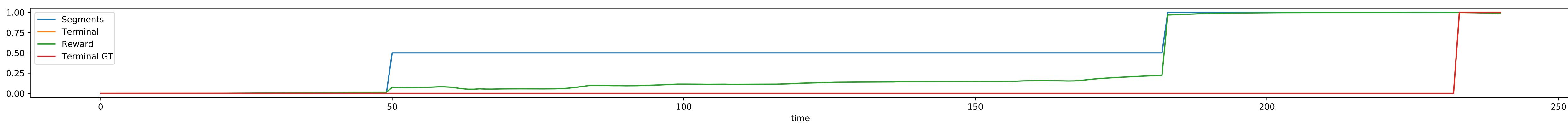
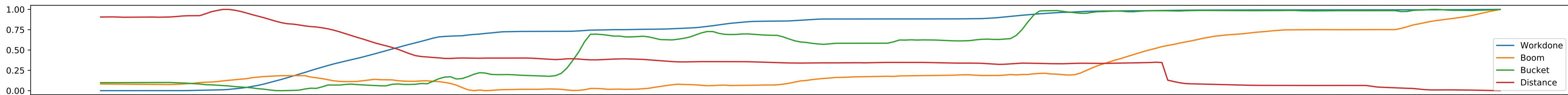
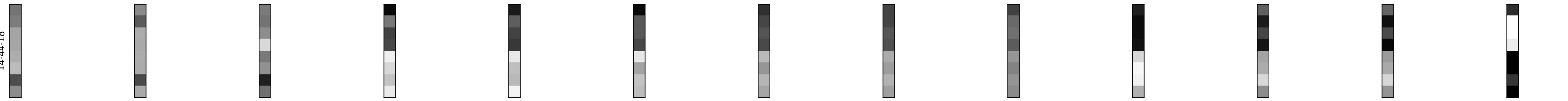
winter - 14-45-06



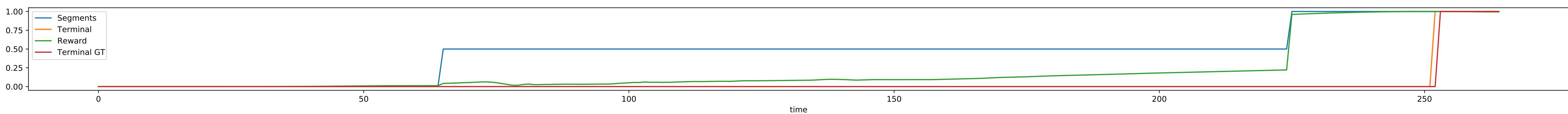
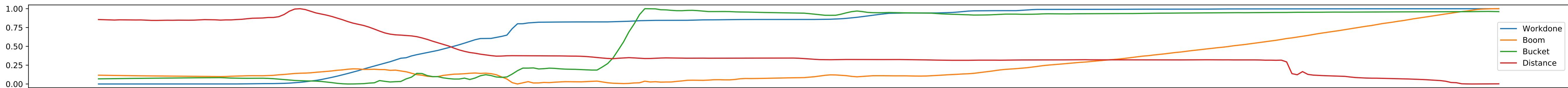
winter - 14-31-37



4-44-18



winter - 14-42-43

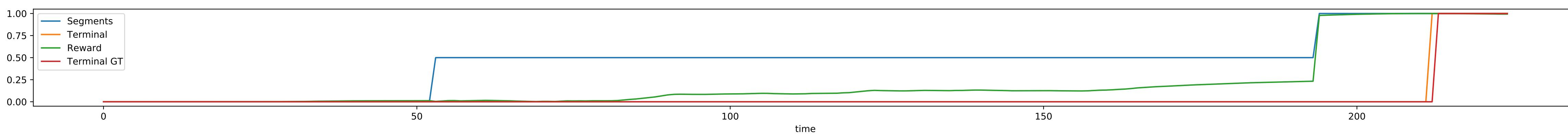
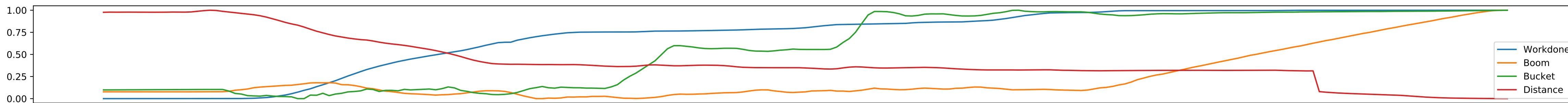
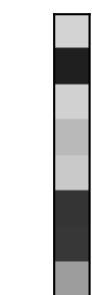


winter - 14-43-16

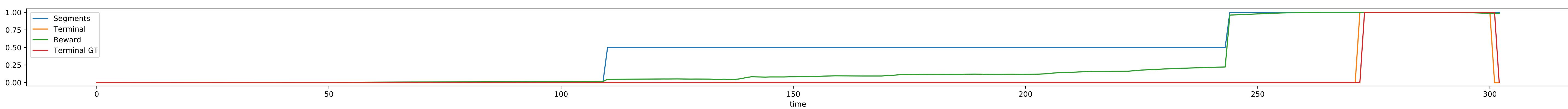
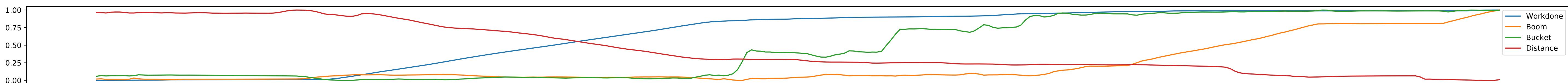
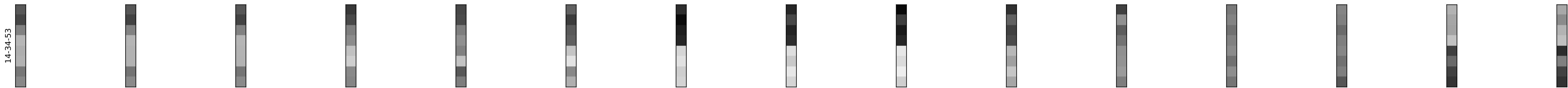
14-43-16



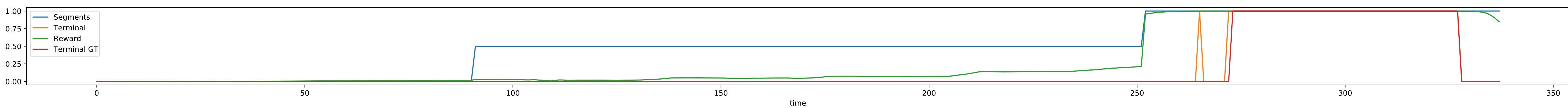
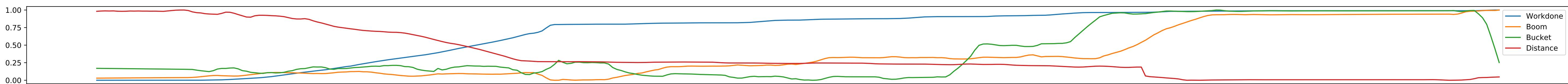
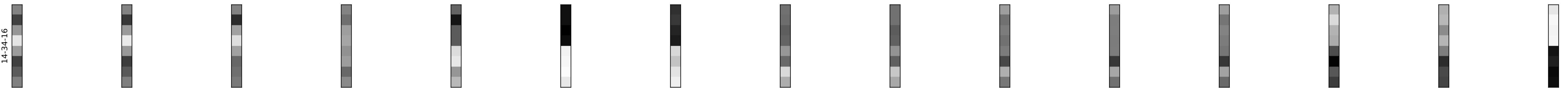
14-43-16



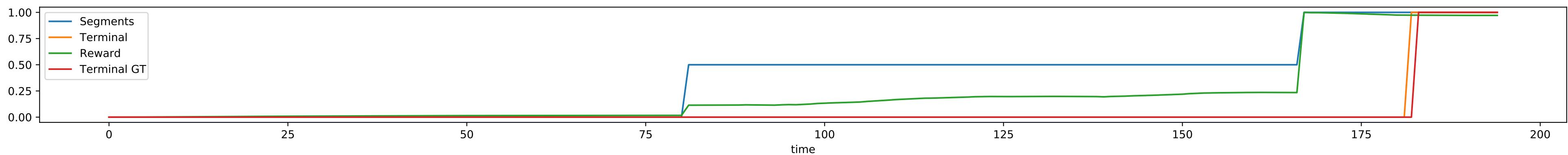
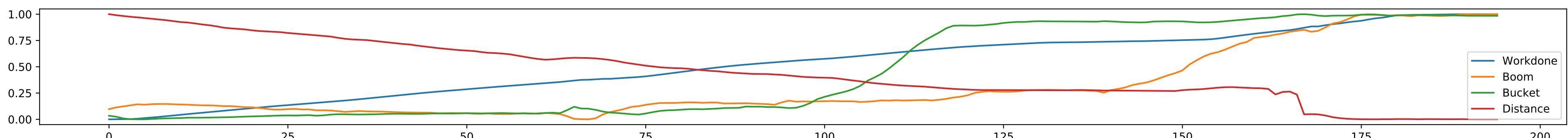
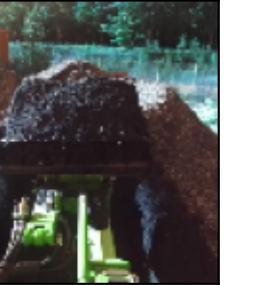
winter - 14-34-53



winter - 14-34-16



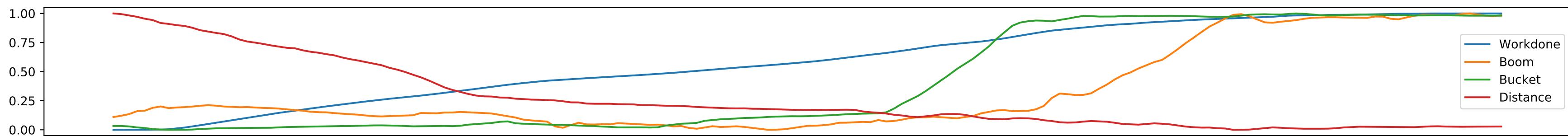
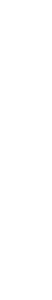
autumn - 16-23-38



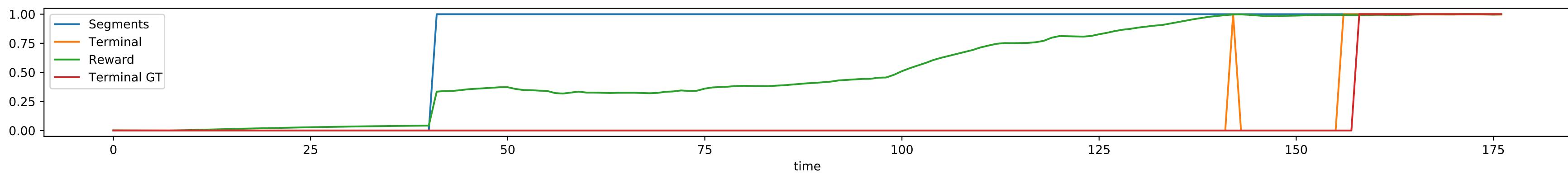
autumn - 19-01-52



19-01-52



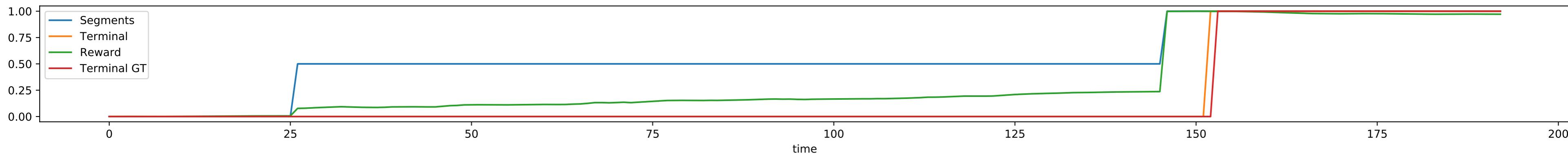
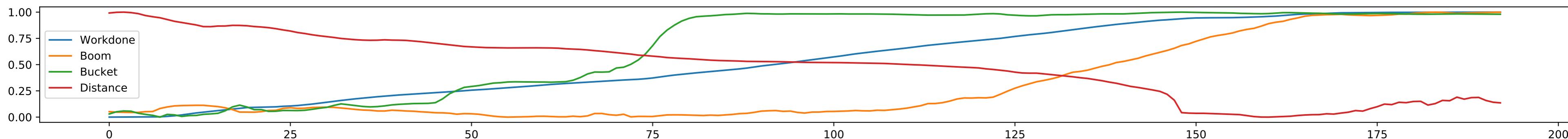
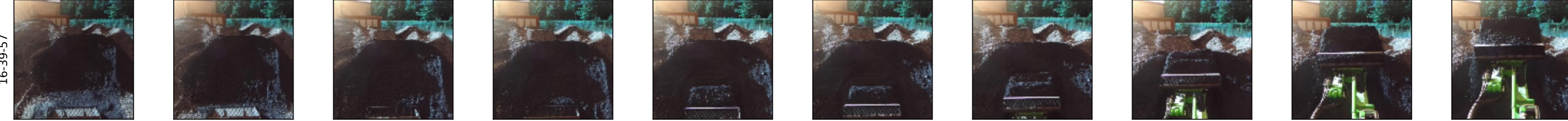
Workdone  
Boom  
Bucket  
Distance



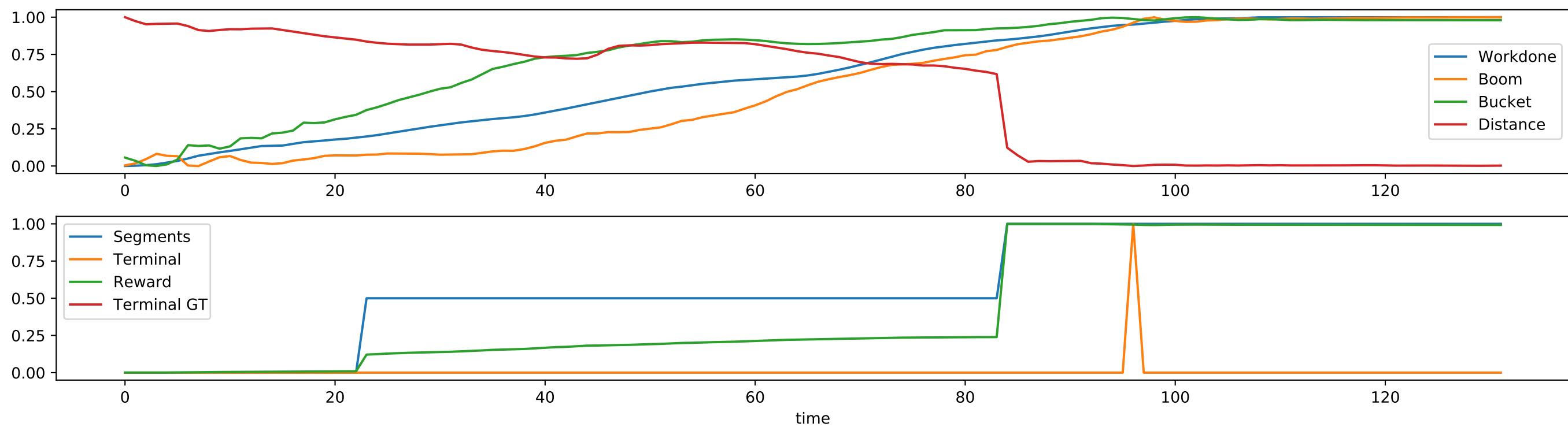
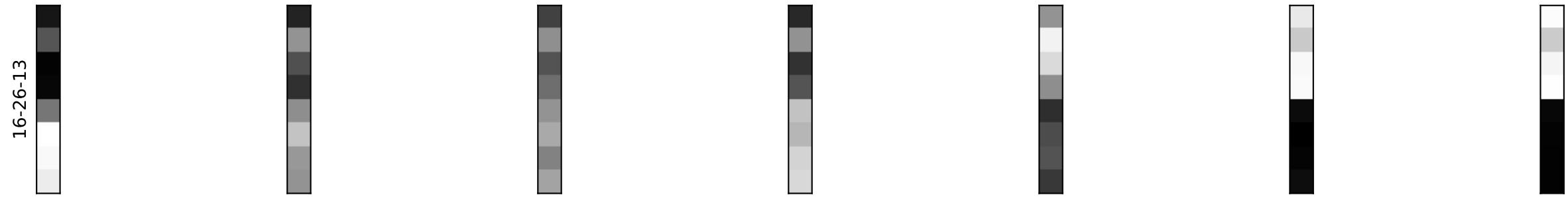
Segments  
Terminal  
Reward  
Terminal GT

time

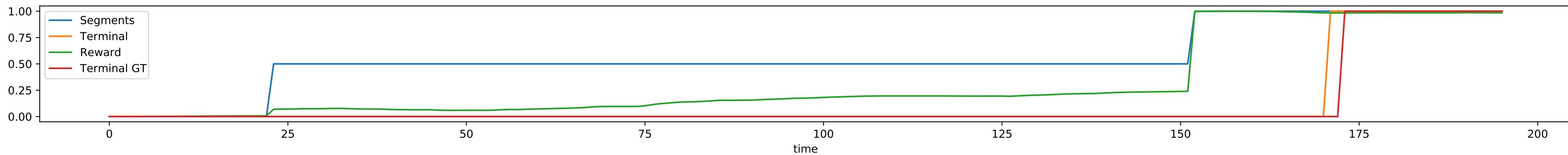
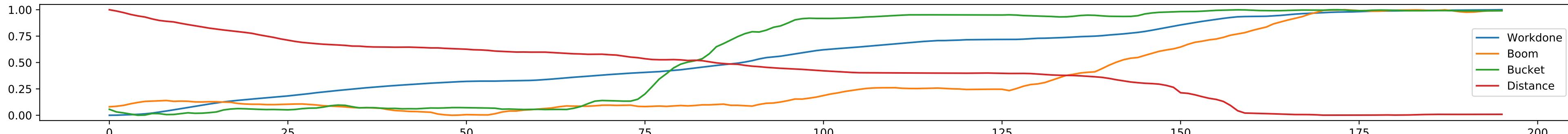
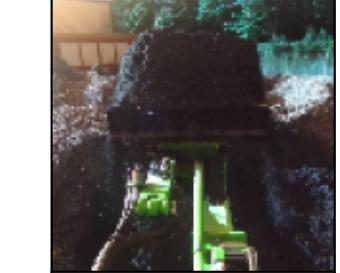
autumn - 16-39-57



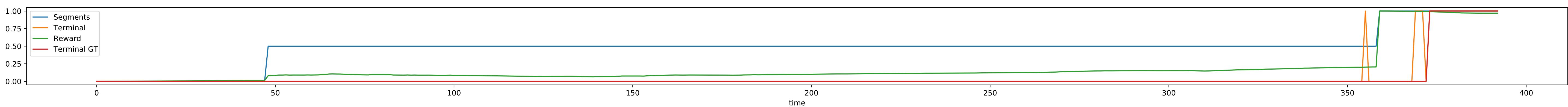
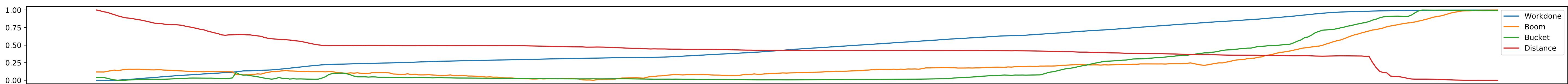
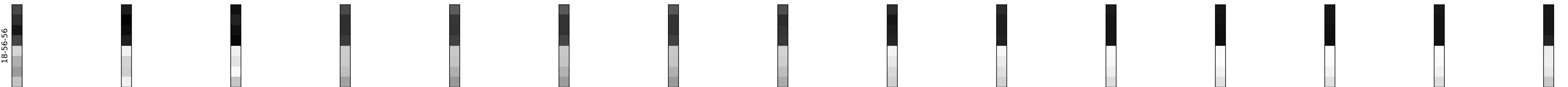
autumn - 16-26-13



autumn - 16-31-52



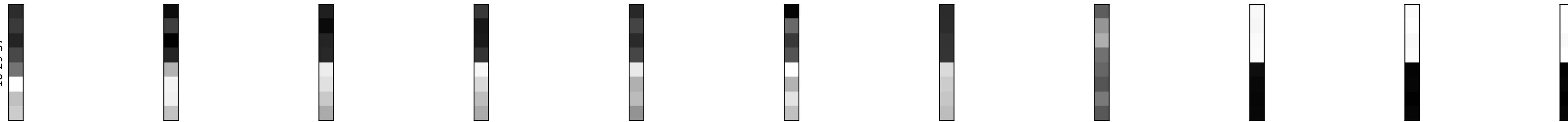
autumn - 18-56-56



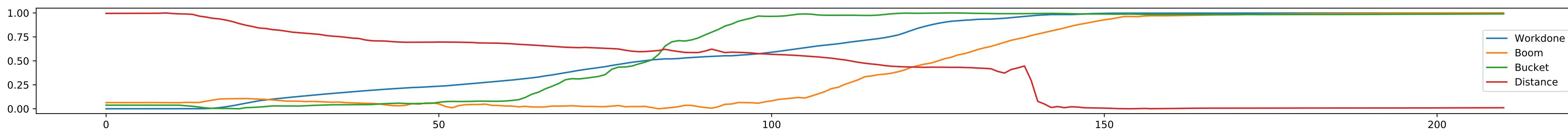
autumn - 16-29-37



16-29-37

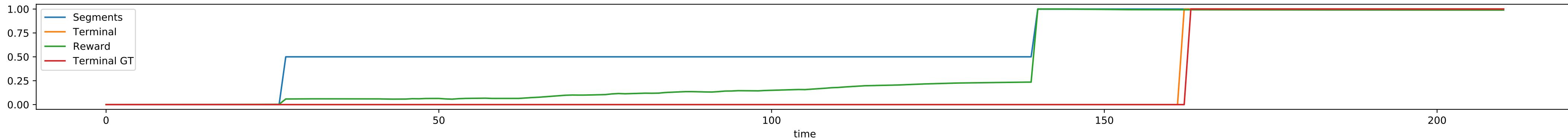


16-29-37



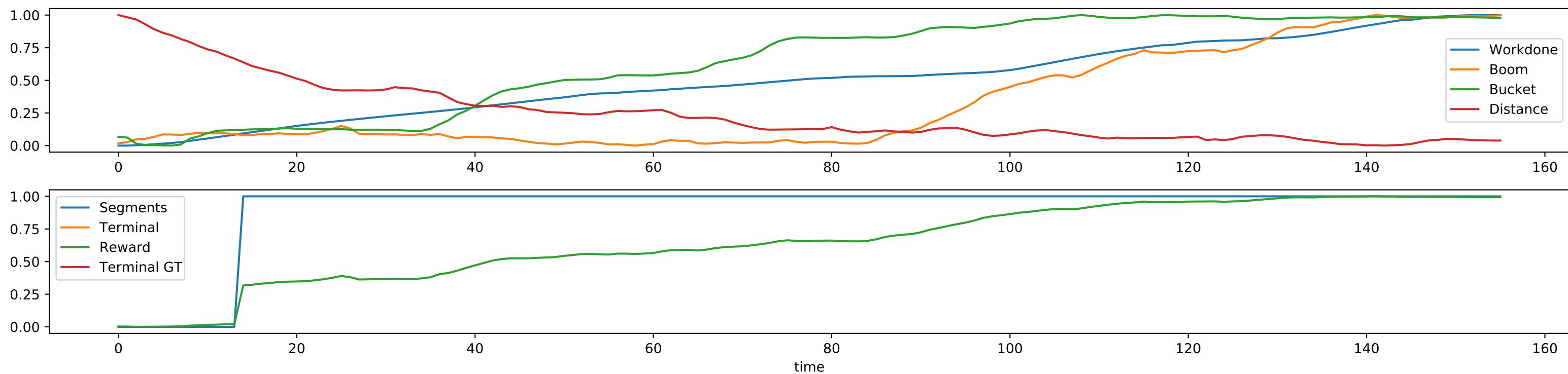
Legend:

- Workdone (Blue)
- Boom (Orange)
- Bucket (Green)
- Distance (Red)

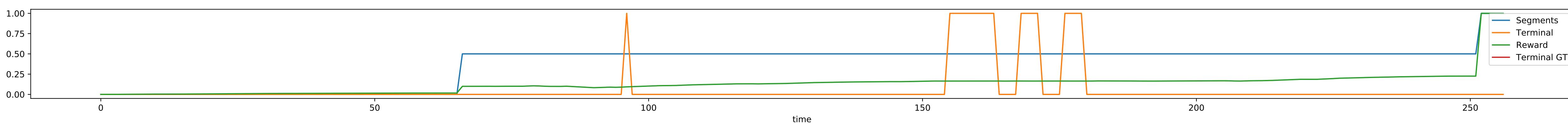
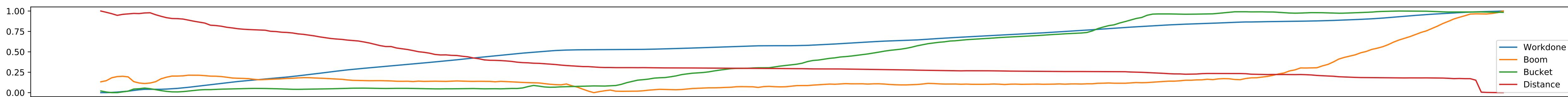
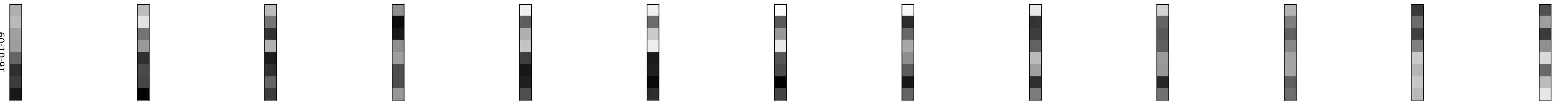


time

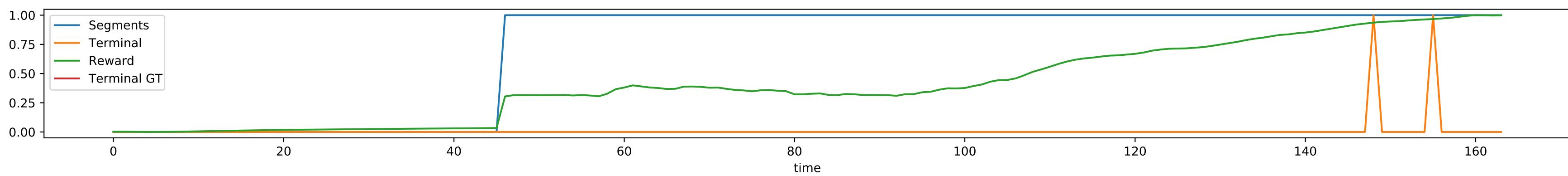
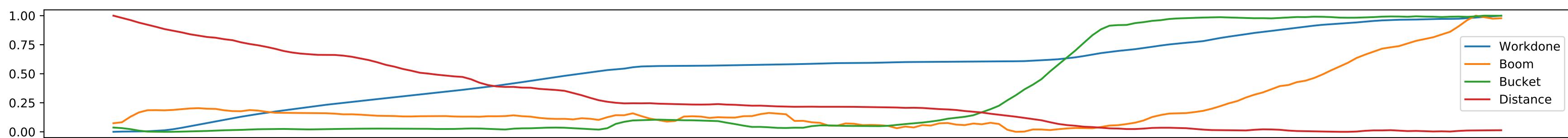
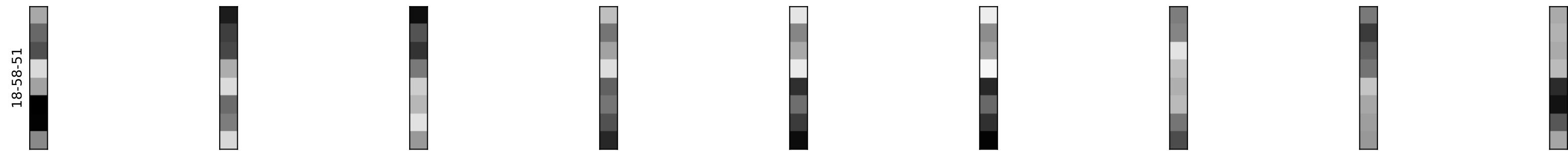
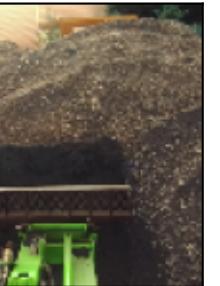
autumn - 16-27-12



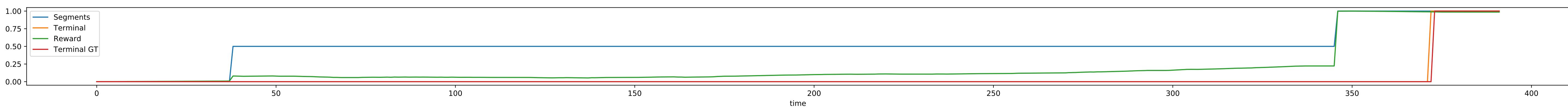
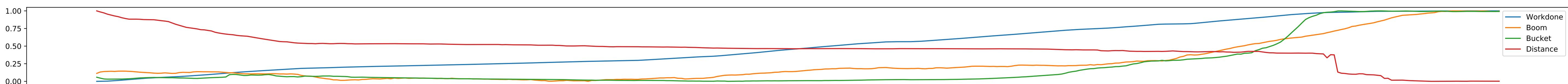
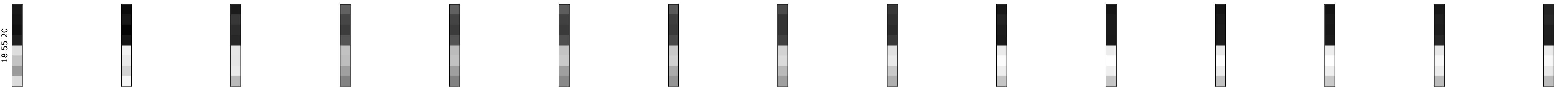
autumn - 16-01-09



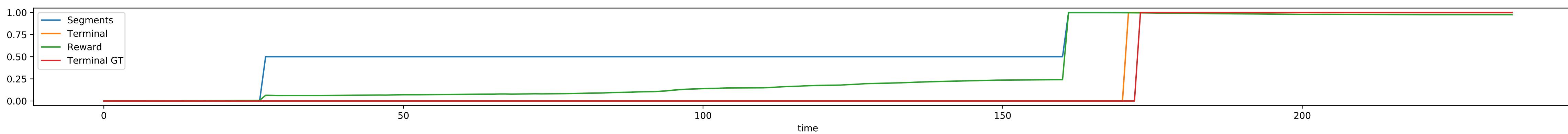
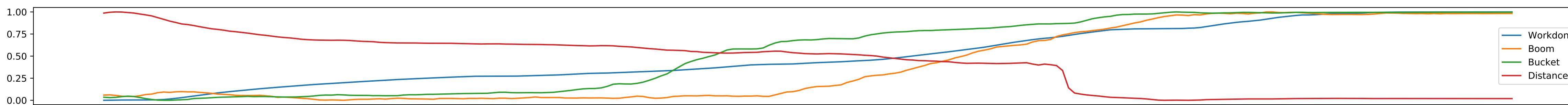
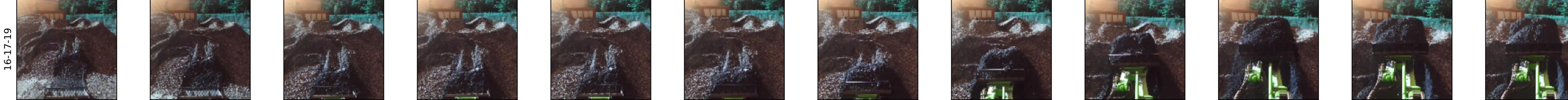
autumn - 18-58-51



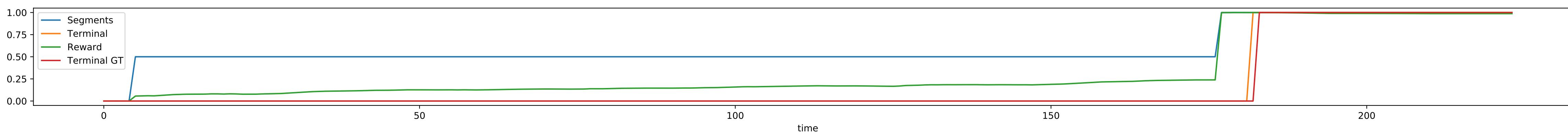
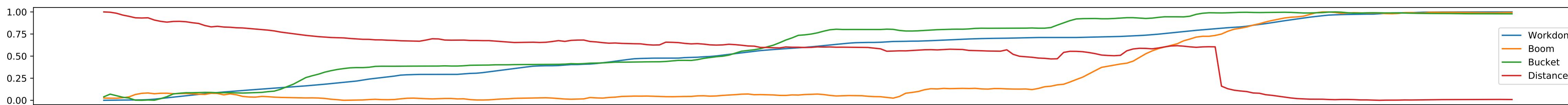
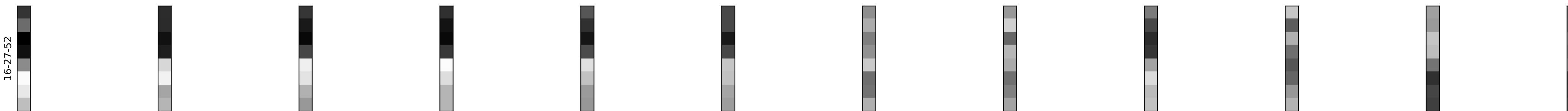
autumn - 18-55-20

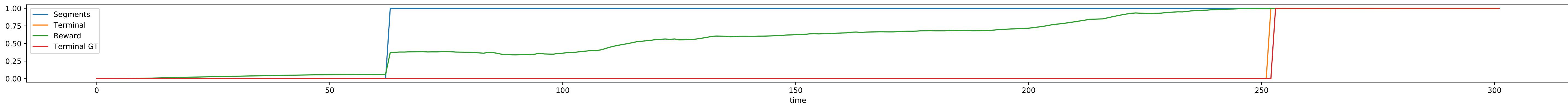
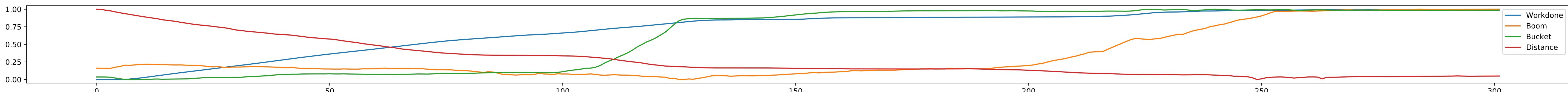
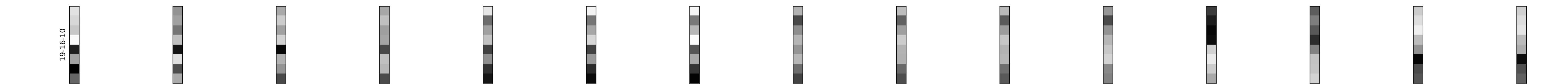


autumn - 16-17-19



autumn - 16-27-52

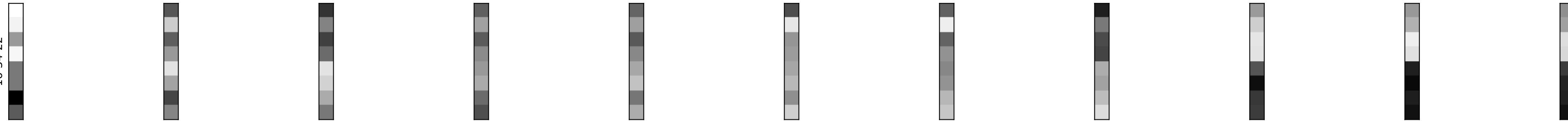




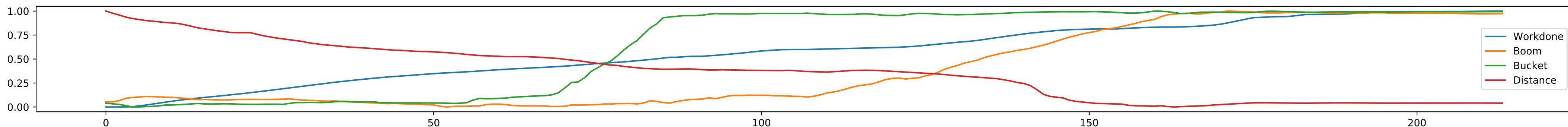
autumn - 16-34-22



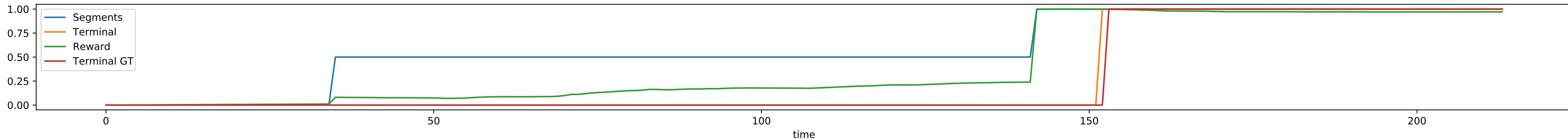
16-34-22



16-34-22



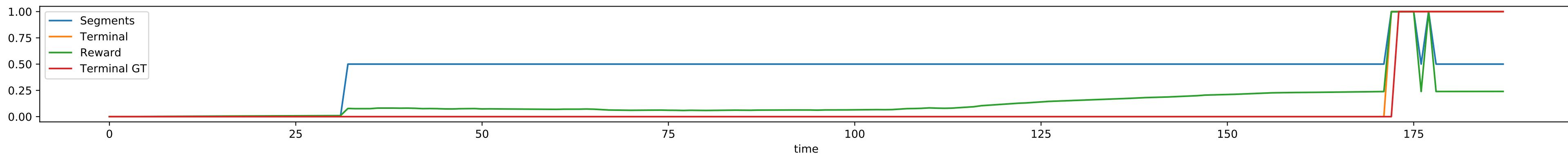
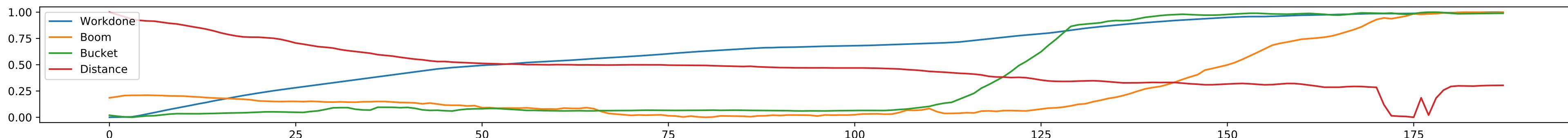
Workdone  
Boom  
Bucket  
Distance



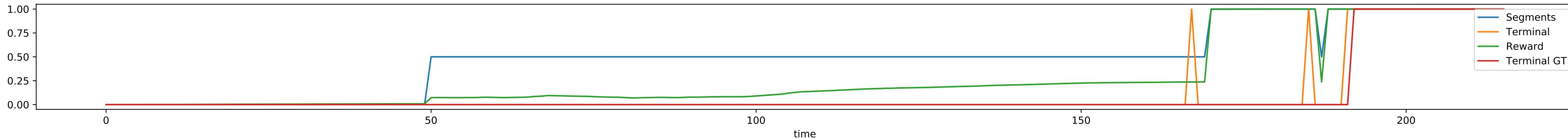
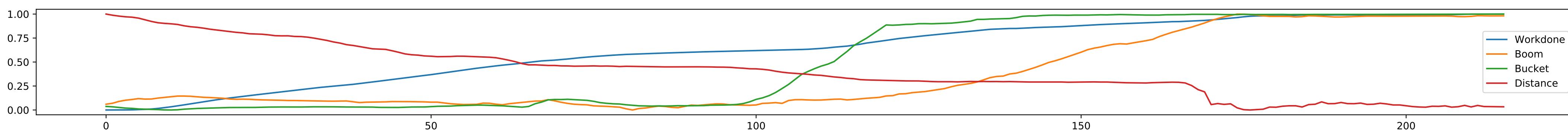
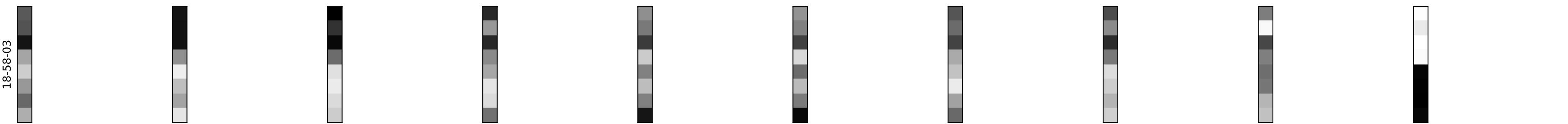
Segments  
Terminal  
Reward  
Terminal GT

time

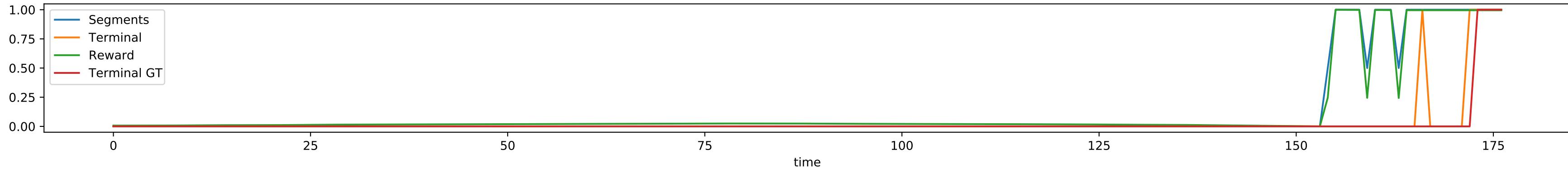
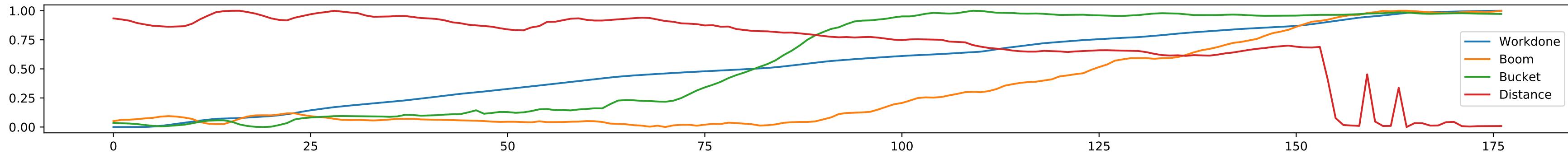
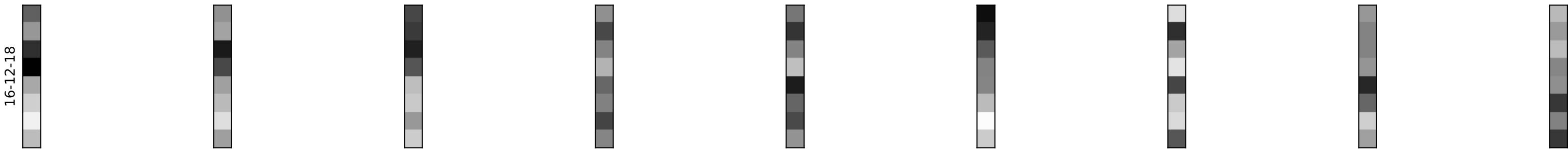
autumn - 18-54-34



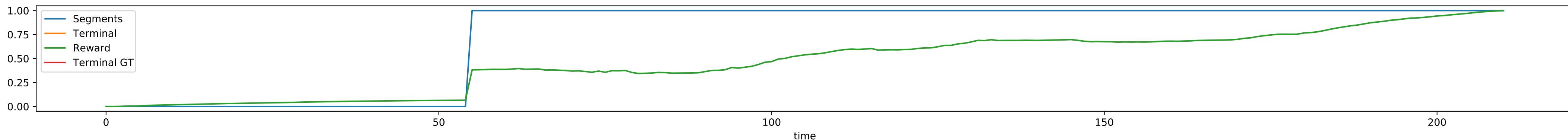
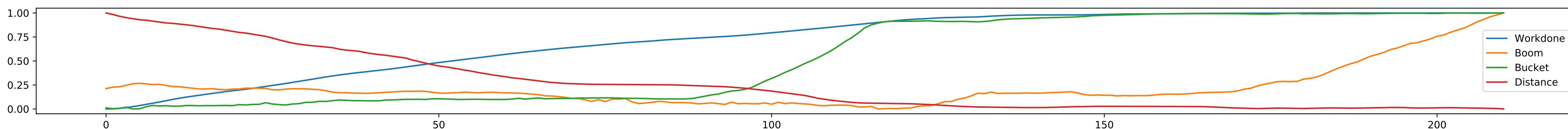
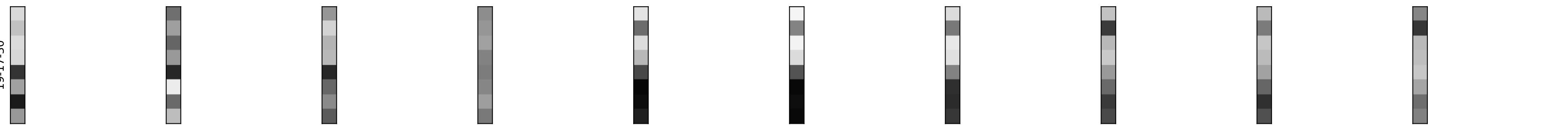
autumn - 18-58-03



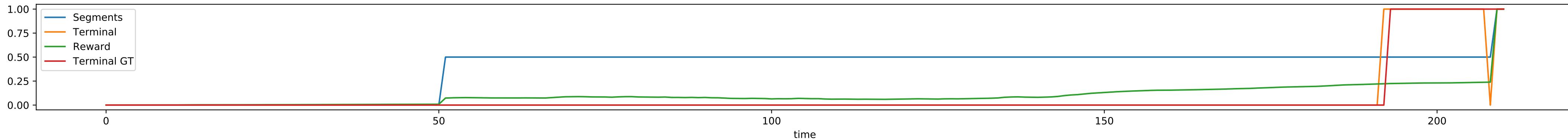
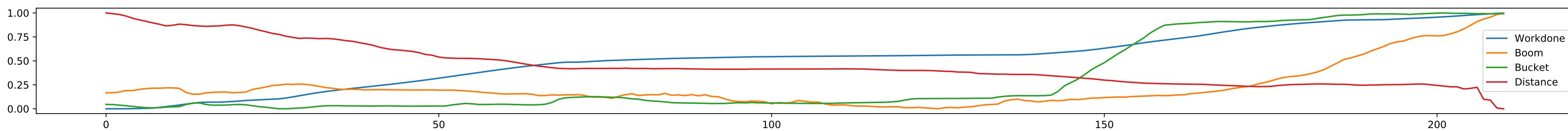
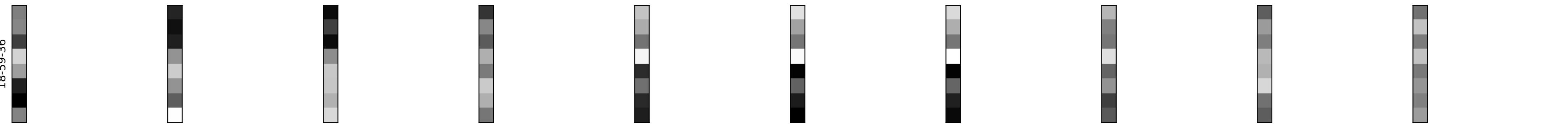
autumn - 16-12-18



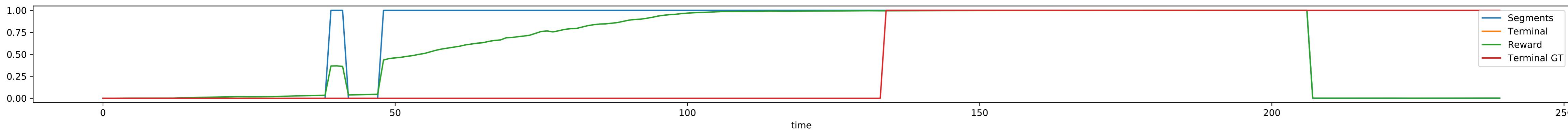
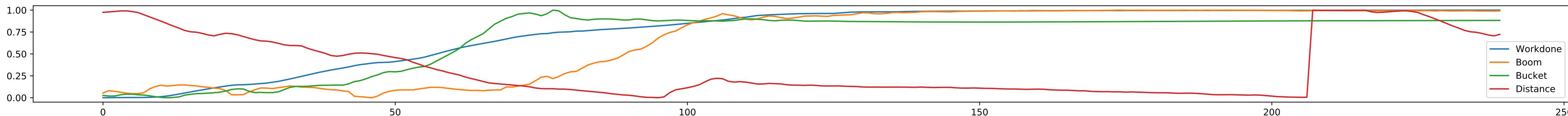
autumn - 19-17-30



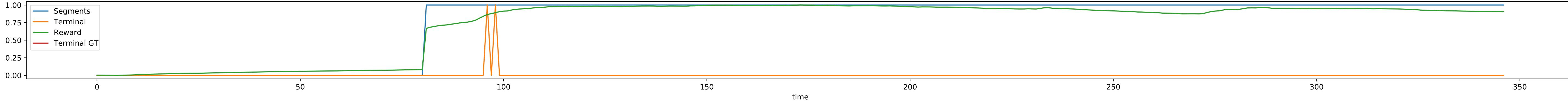
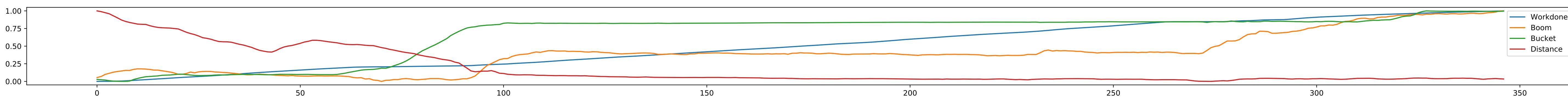
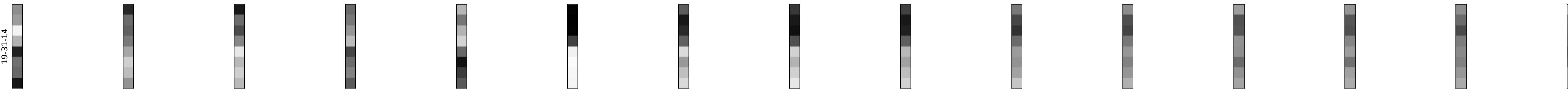
autumn - 18-59-36



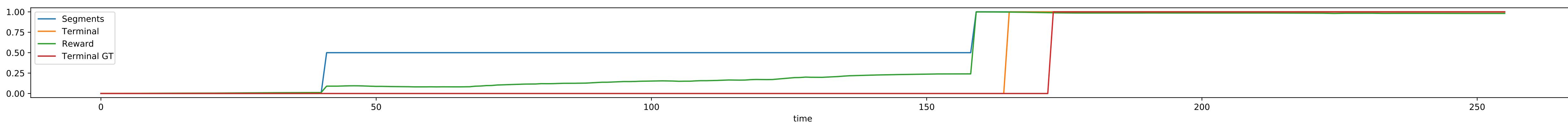
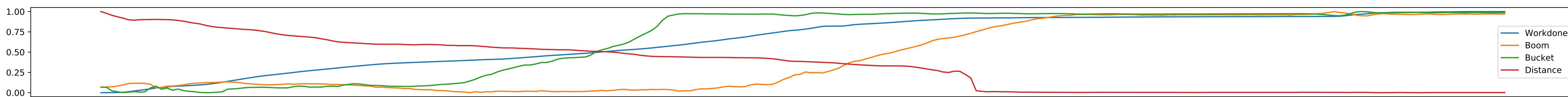
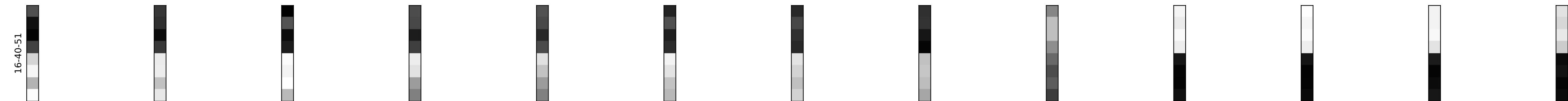
autumn - 18-50-54



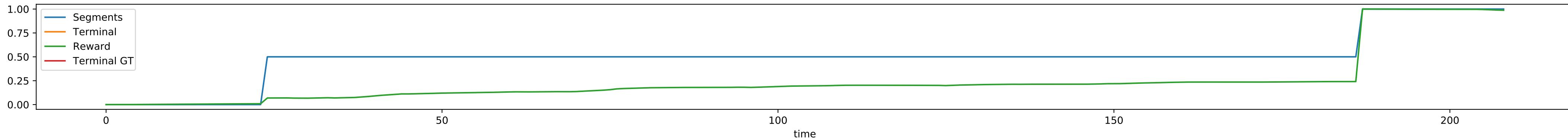
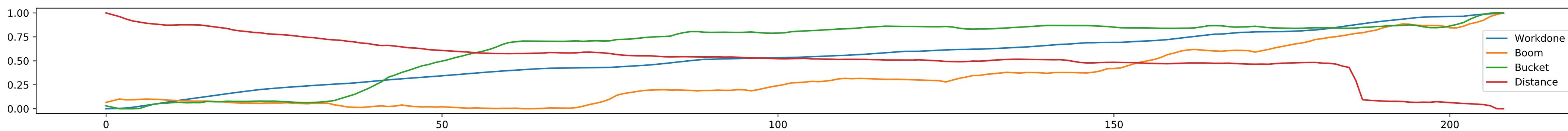
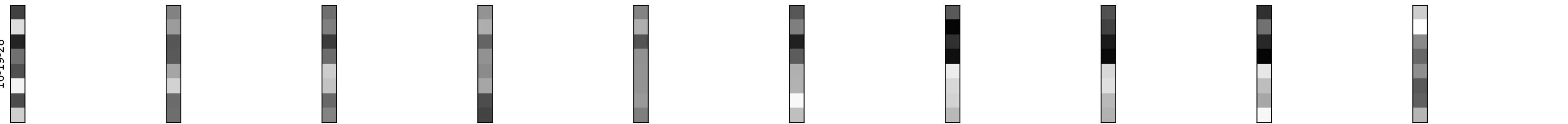
autumn - 19-31-14



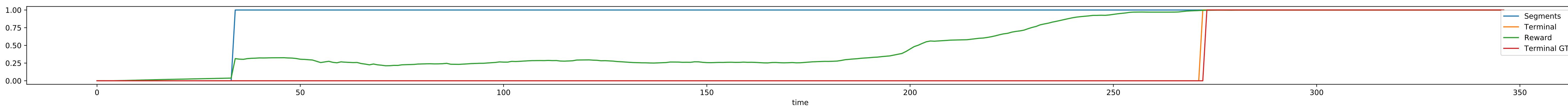
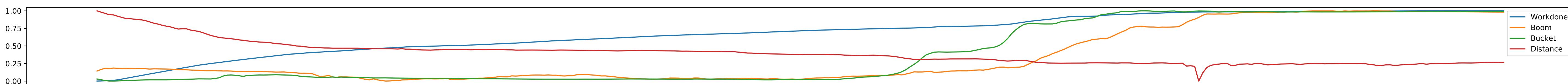
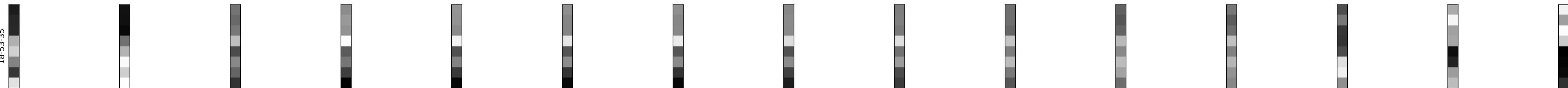
autumn - 16-40-51



autumn - 16-19-28

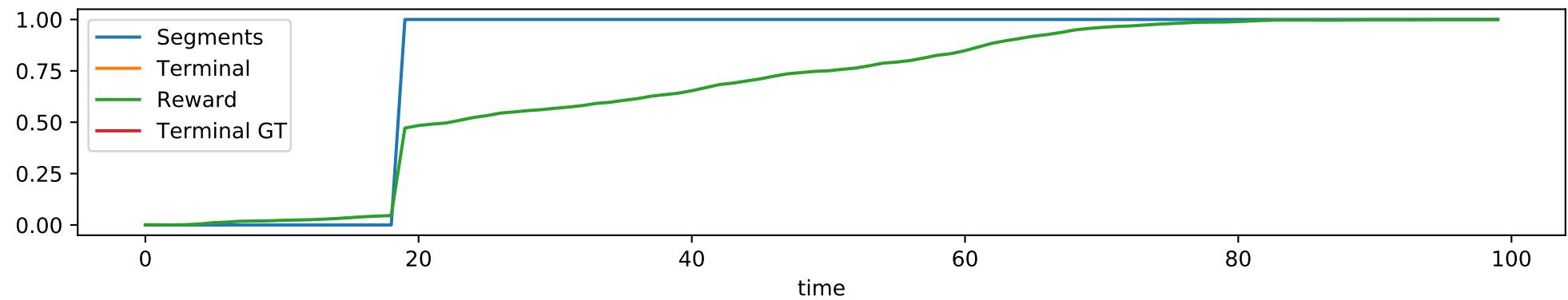
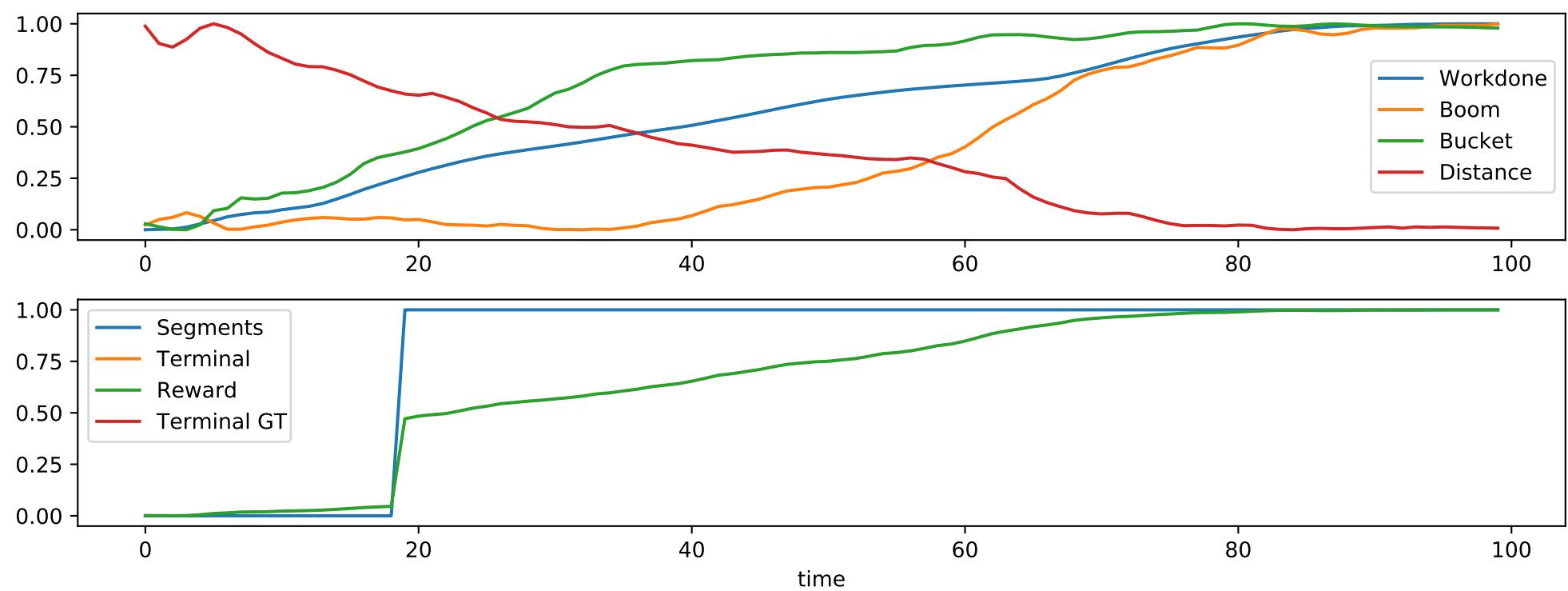
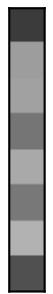


autumn - 18-53-35



autumn - 16-18-15

16-18-15



autumn - 16-18-15

16-18-15

