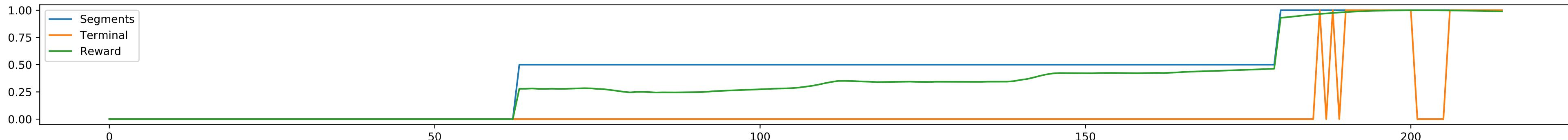
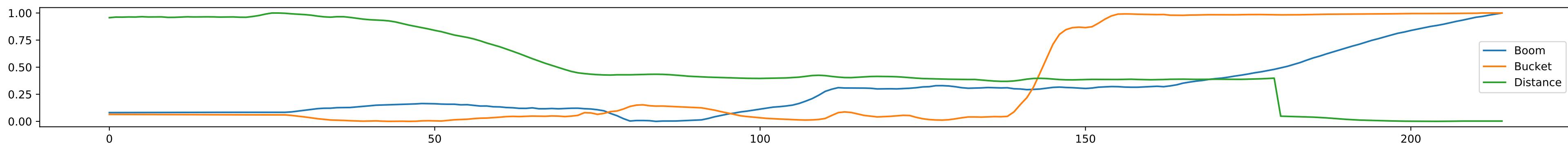


# Learning Reward from Demonstrations

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_max 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

14-46-18

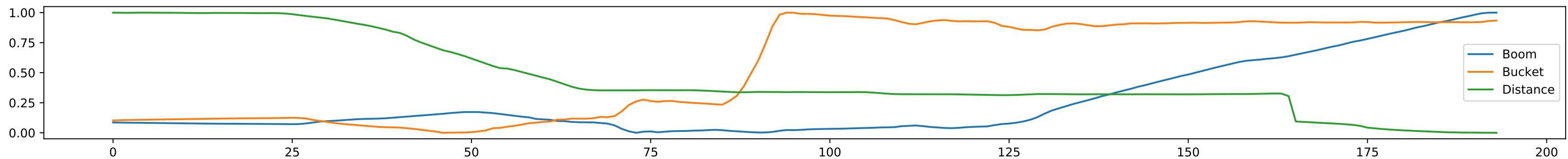


winter - 14-40-52

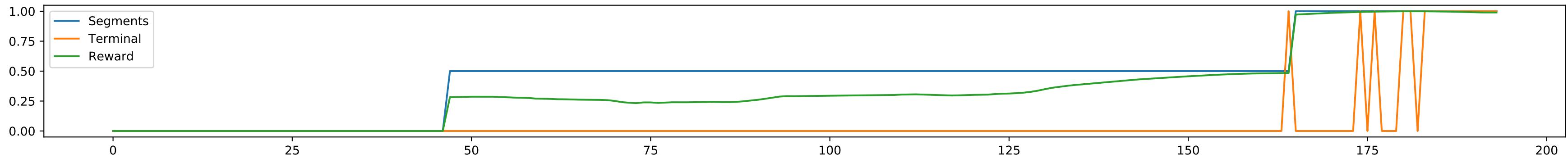
14-40-52



14-40-52

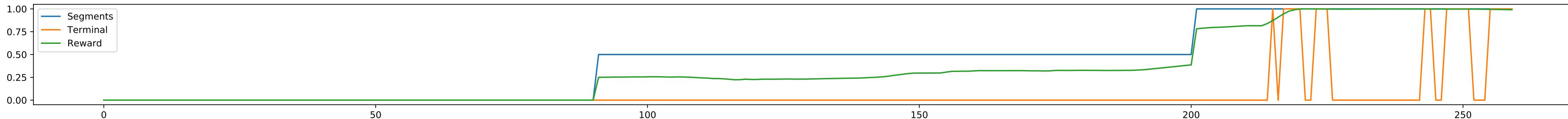
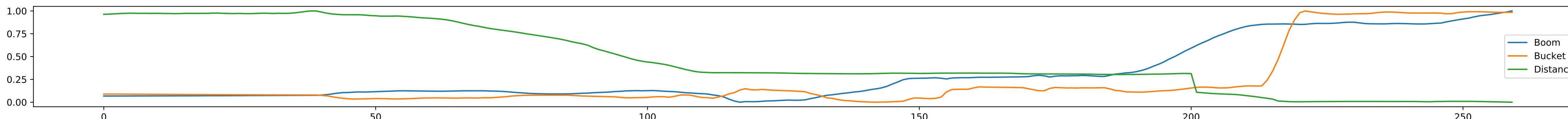
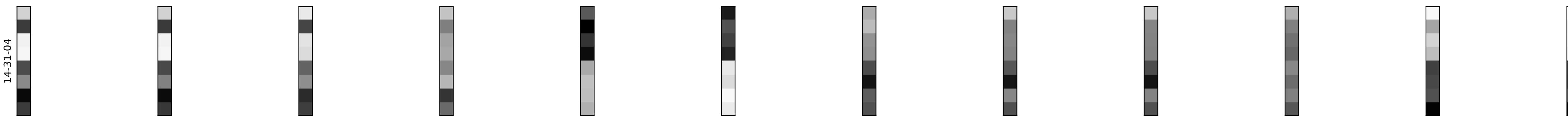


- Boom
- Bucket
- Distance

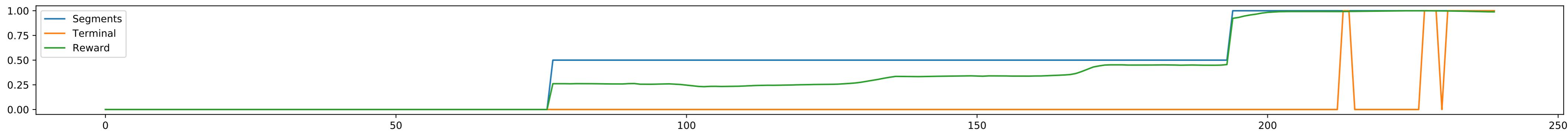
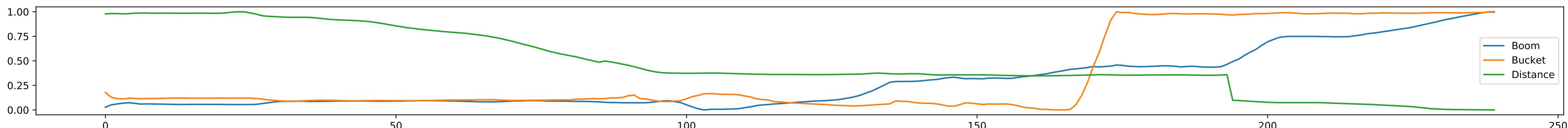
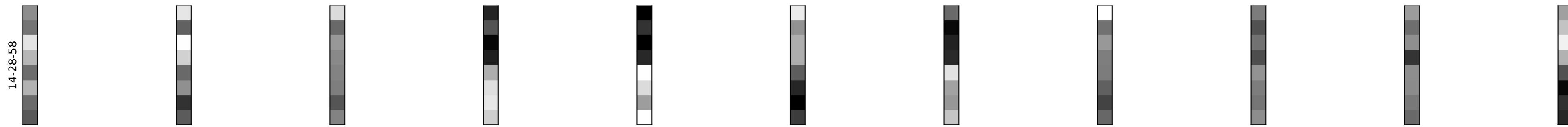
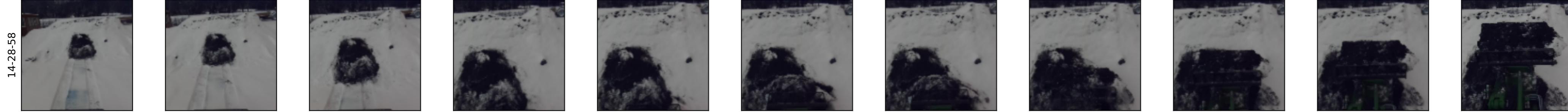


- Segments
- Terminal
- Reward

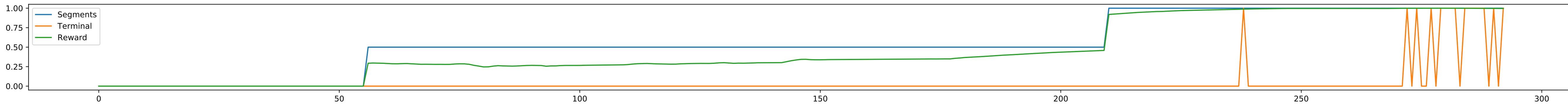
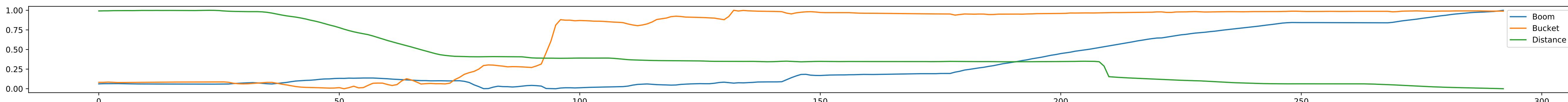
winter - 14-31-04



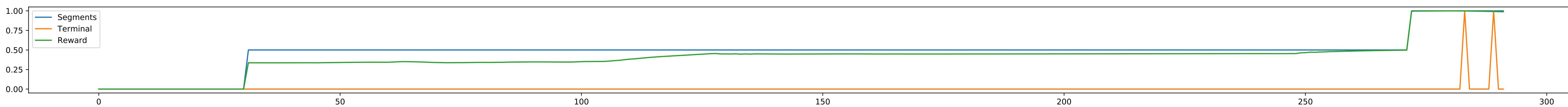
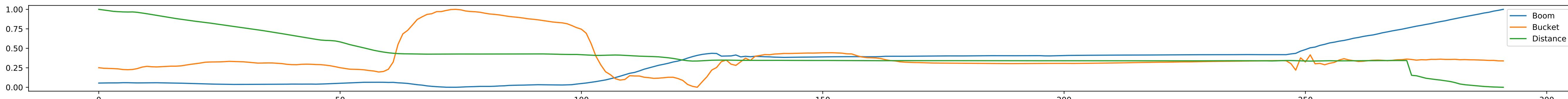
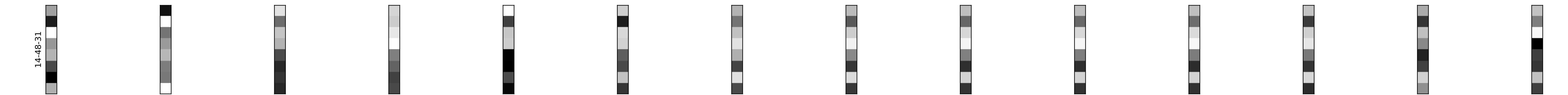
winter - 14-28-58



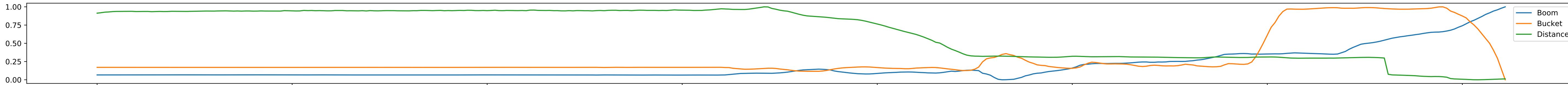
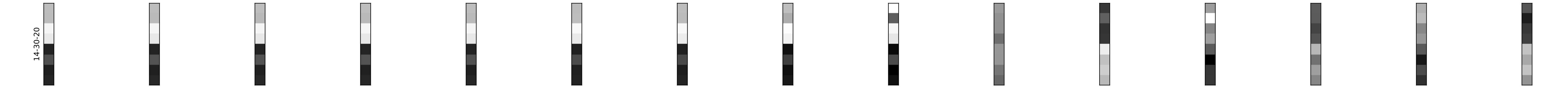
winter - 14-40-19



winter - 14-48-31



winter - 14-30-20



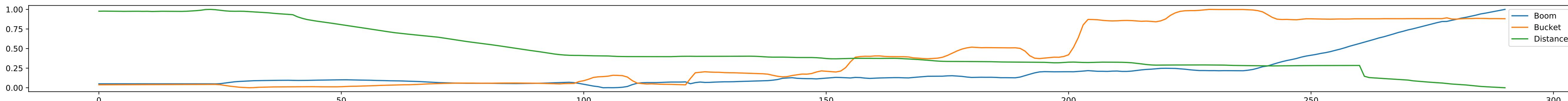
winter - 14-39-44



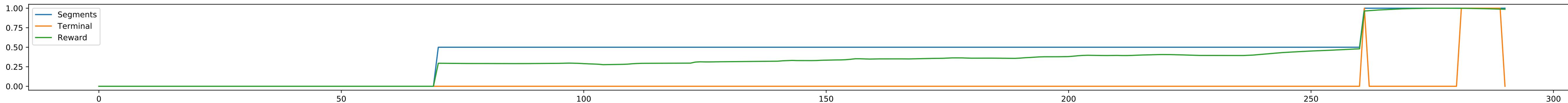
14-39-44



14-39-44

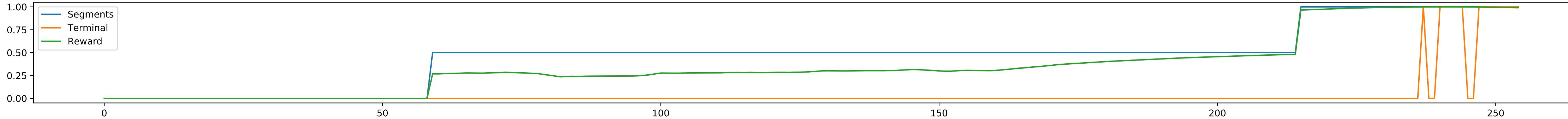
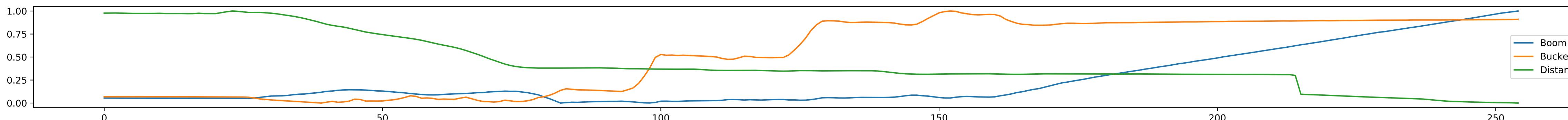


Boom  
Bucket  
Distance



Segments  
Terminal  
Reward

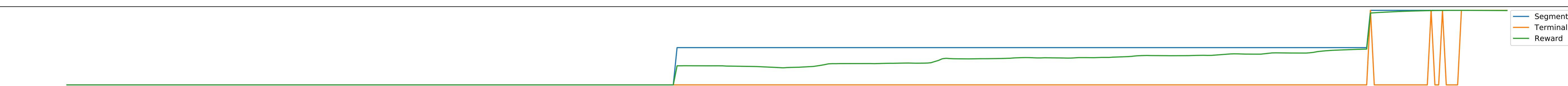
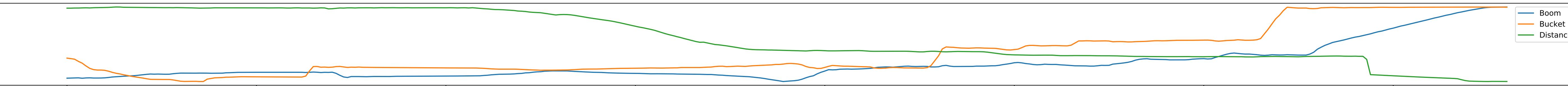
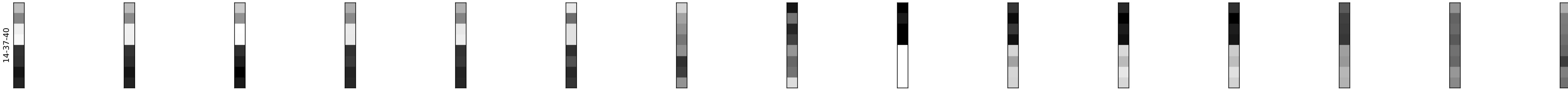
winter - 14-41-52



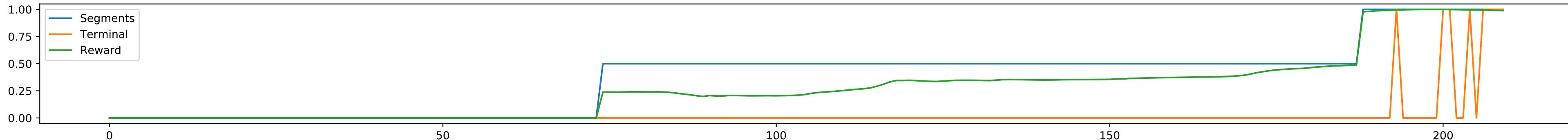
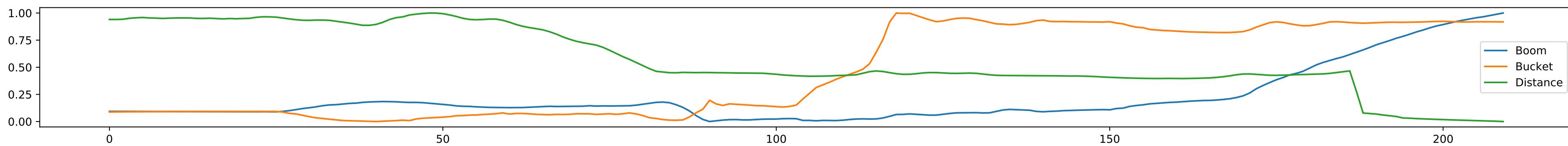
winter - 14-37-40



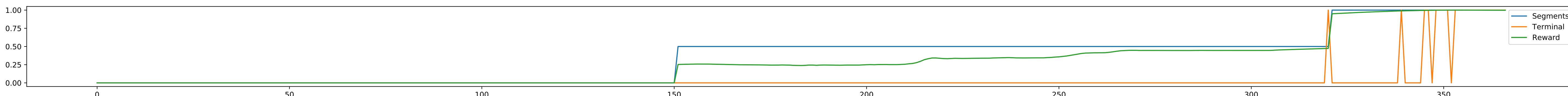
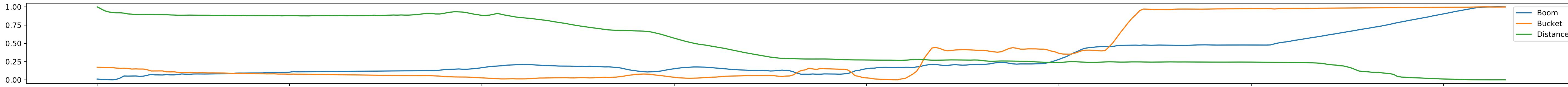
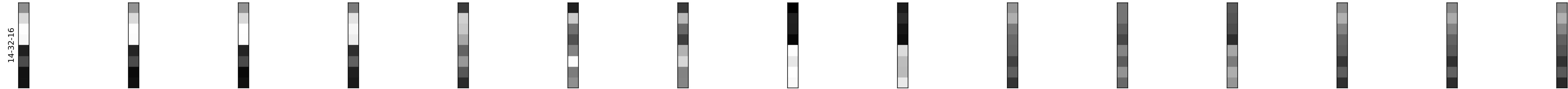
14-37-40



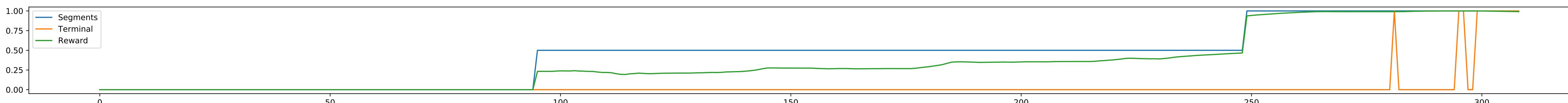
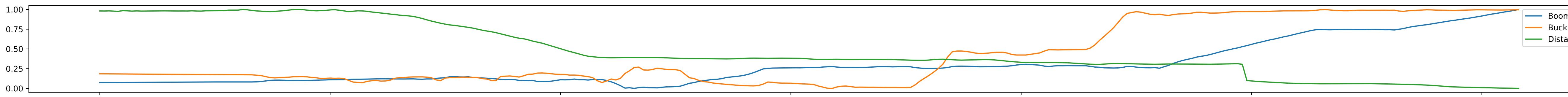
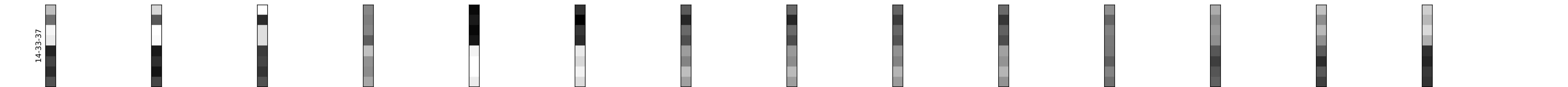
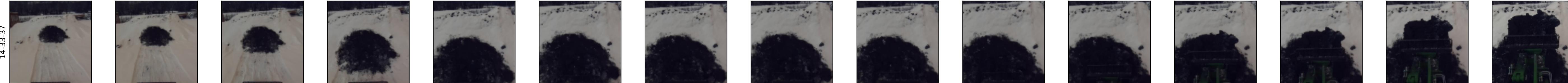
winter - 14-43-49



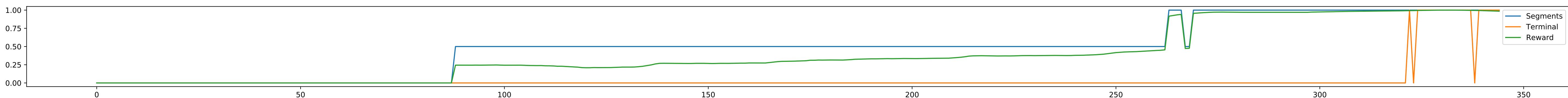
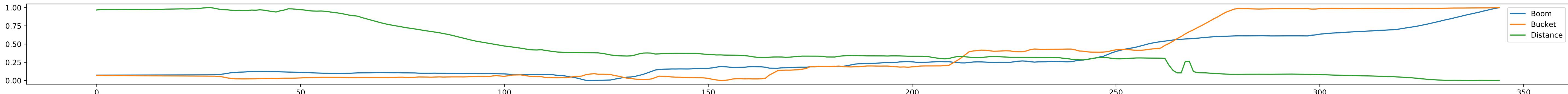
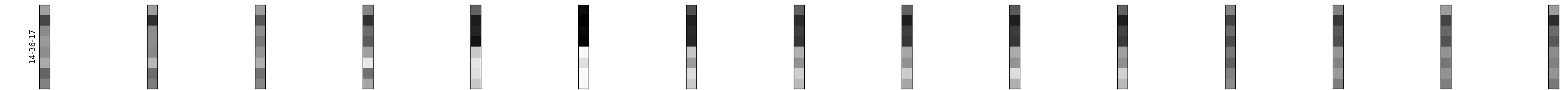
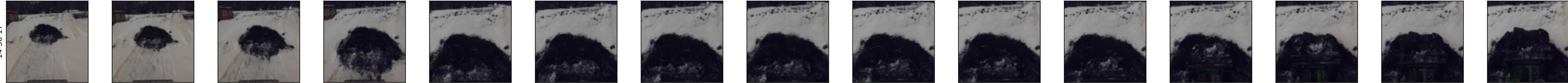
winter - 14-32-16



winter - 14-33-37



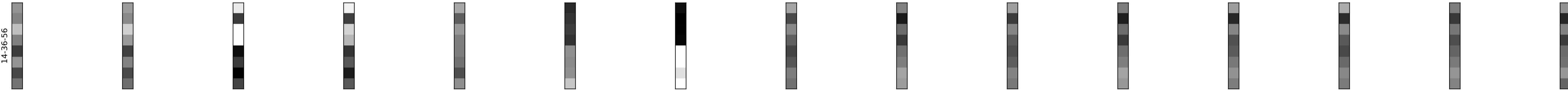
winter - 14-36-17



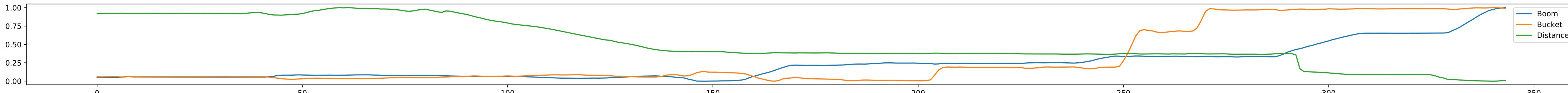
winter - 14-36-56



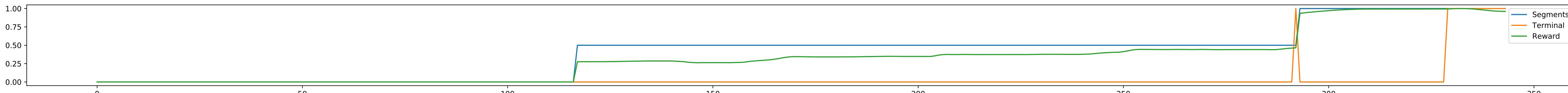
14-36-56



14-36-56



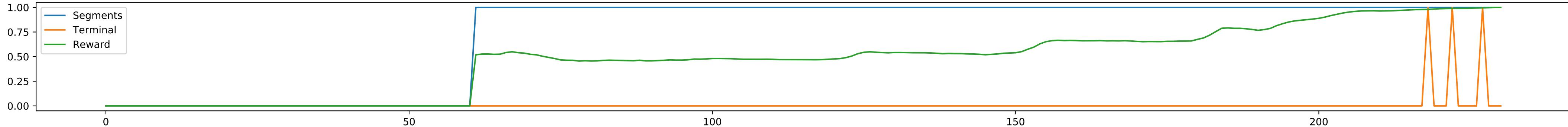
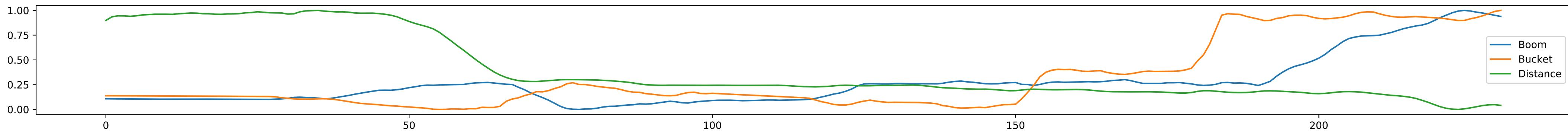
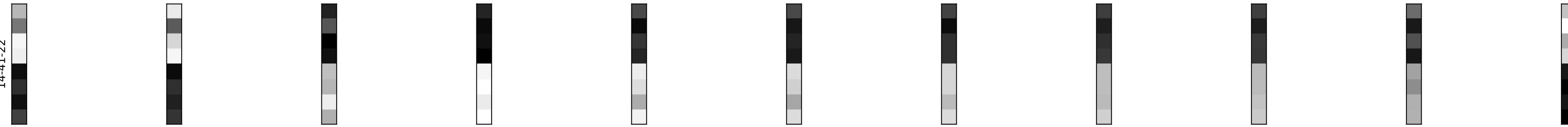
Boom  
Bucket  
Distance



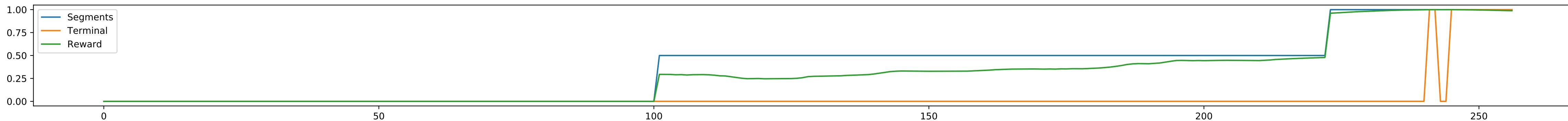
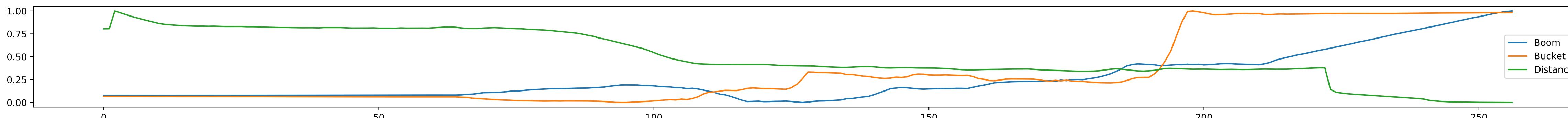
Segments  
Terminal  
Reward

winter - 14-41-22

14-41-22



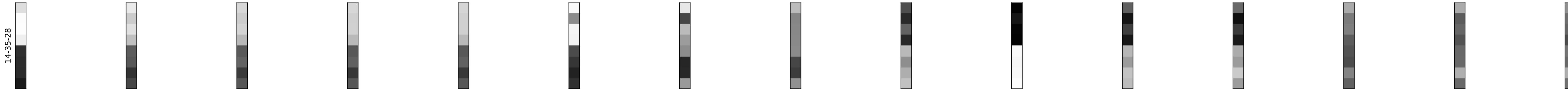
winter - 14-45-38



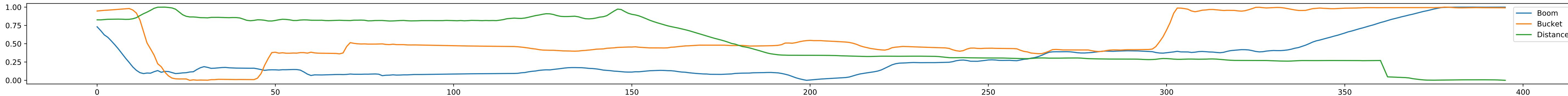
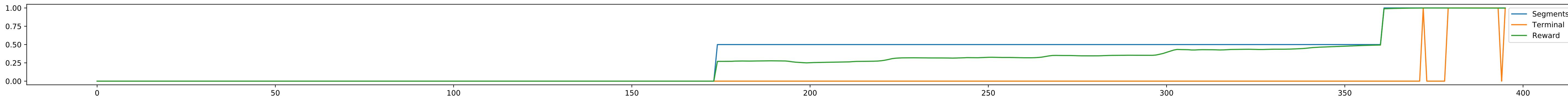
winter - 14-35-28



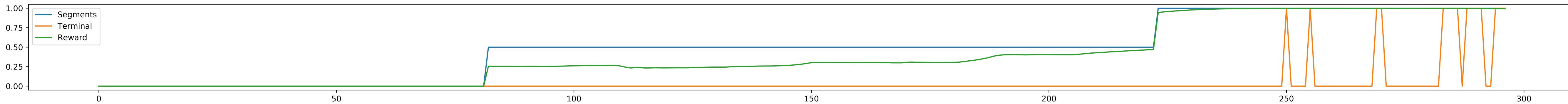
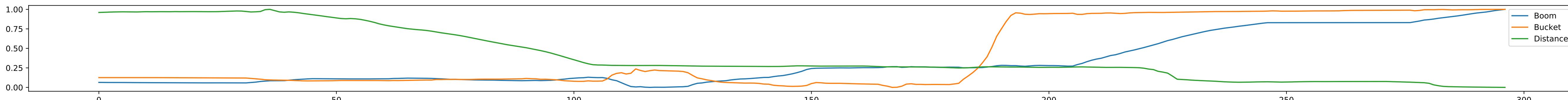
14-35-28



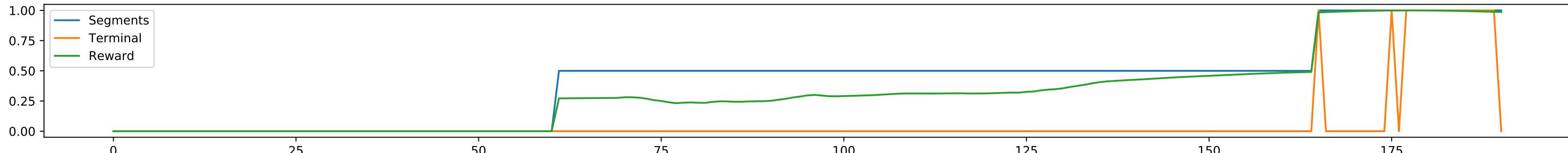
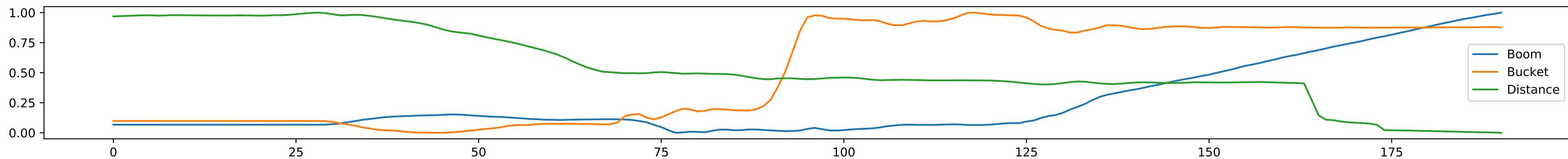
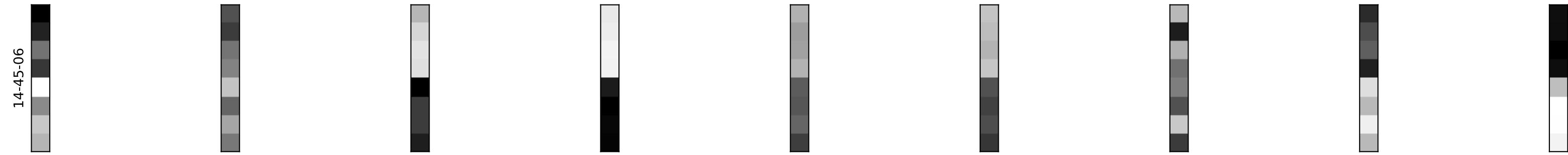
14-35-28

Boom  
Bucket  
DistanceSegments  
Terminal  
Reward

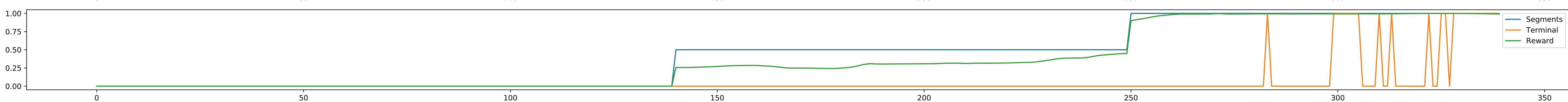
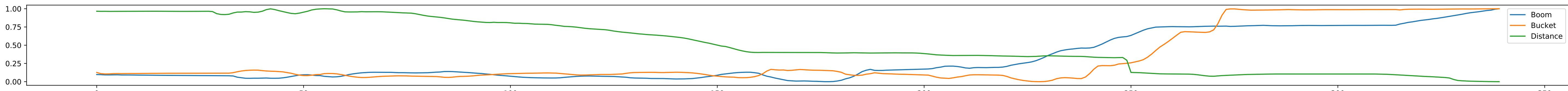
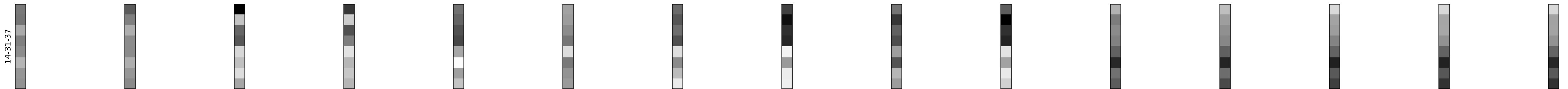
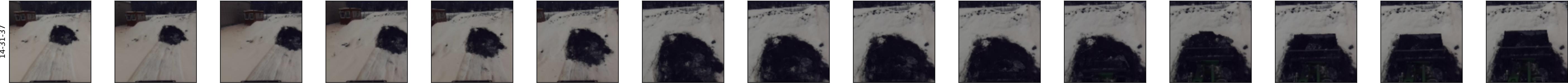
winter - 14-32-57



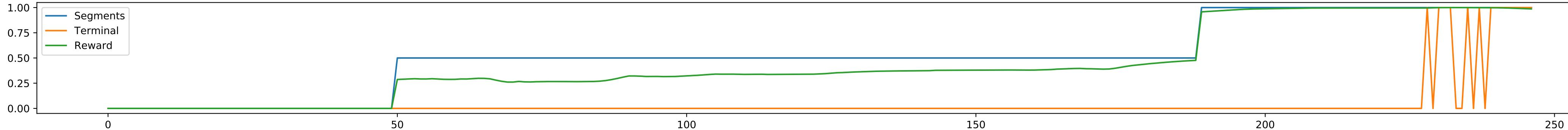
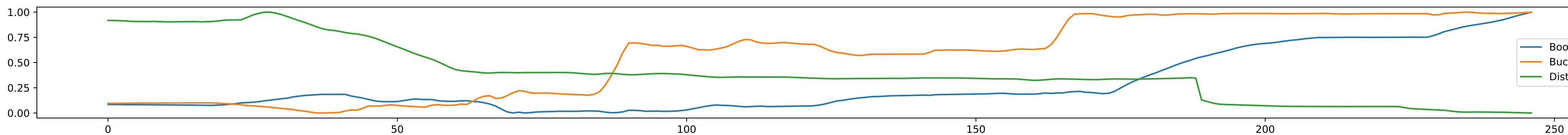
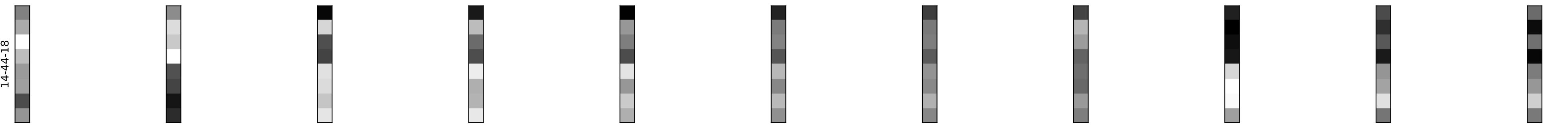
winter - 14-45-06



winter - 14-31-37



winter - 14-44-18

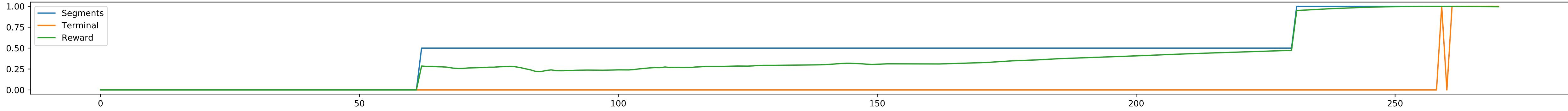
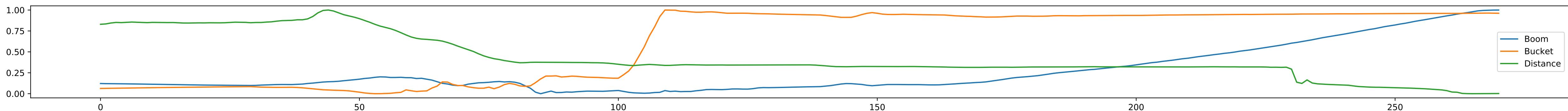
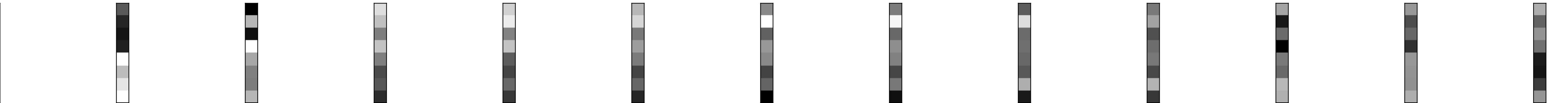


winter - 14-42-43

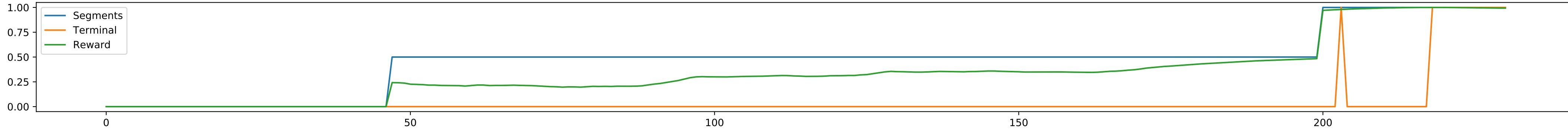
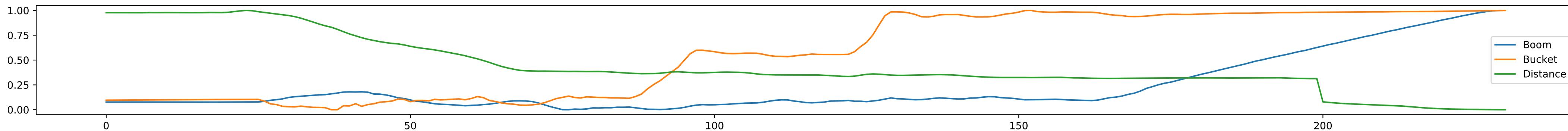
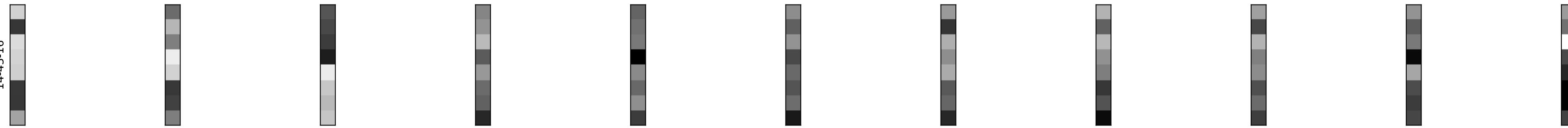
14-42-43



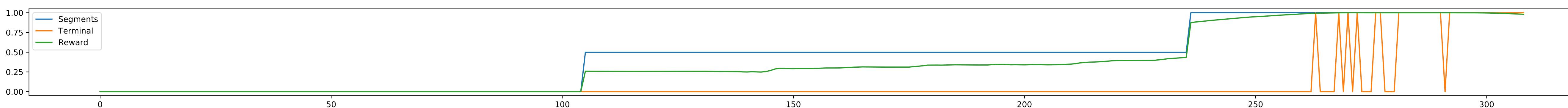
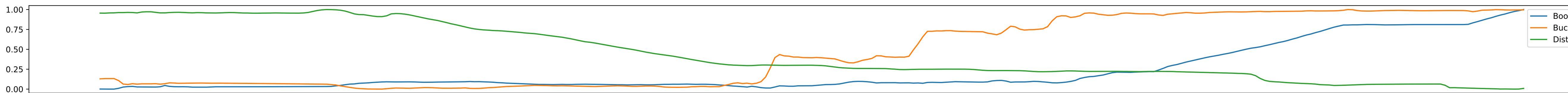
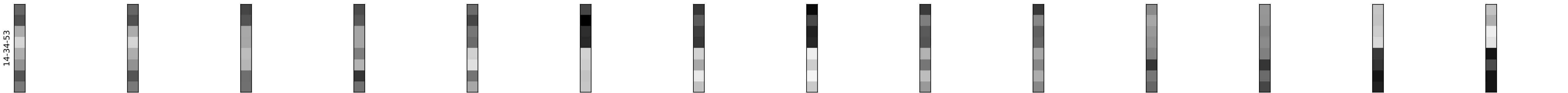
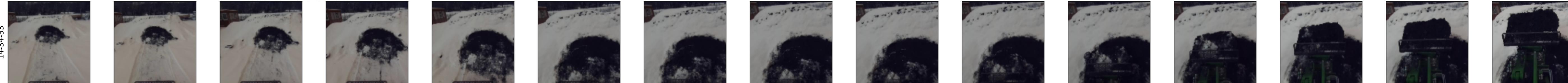
14-42-43



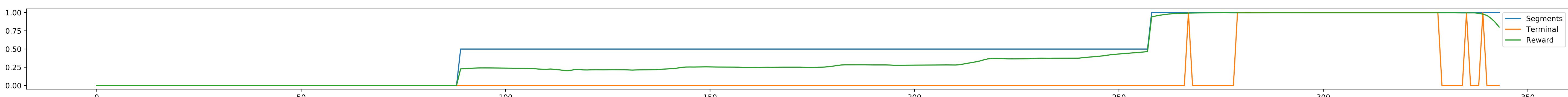
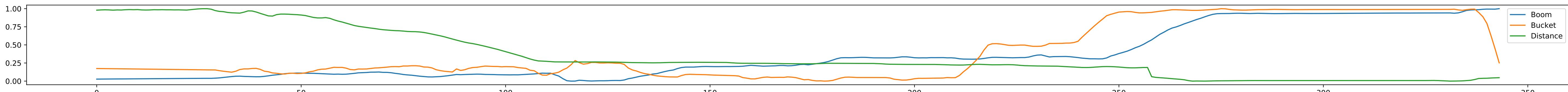
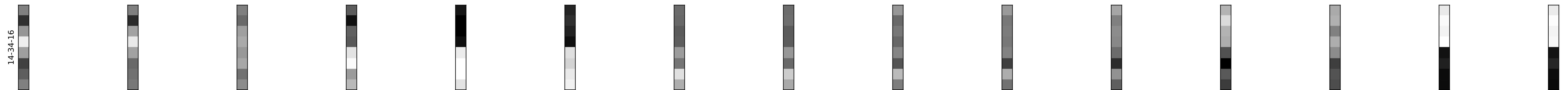
winter - 14-43-16



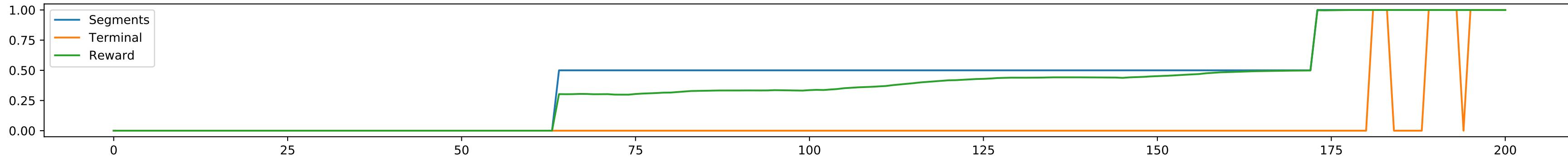
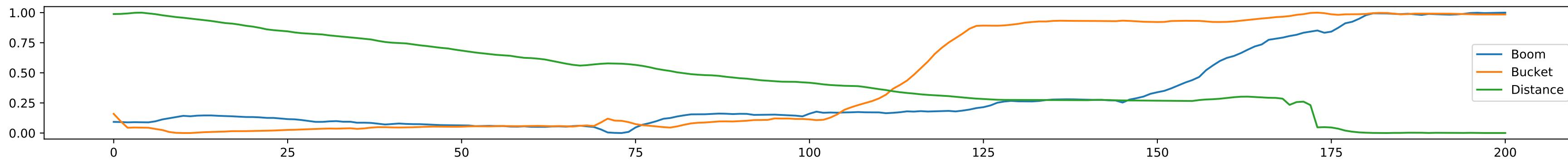
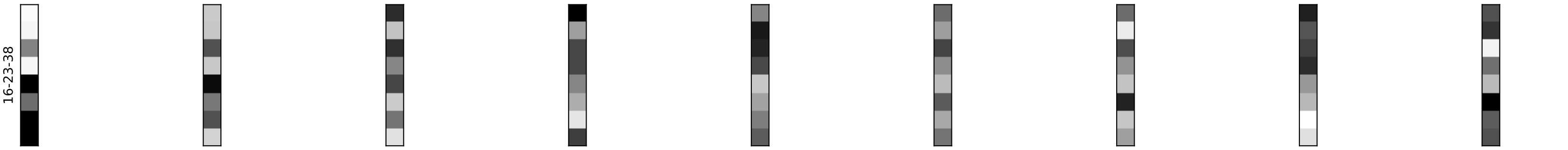
winter - 14-34-53



winter - 14-34-16



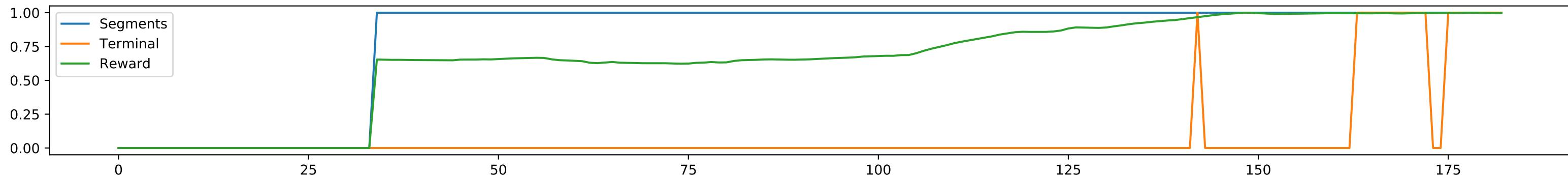
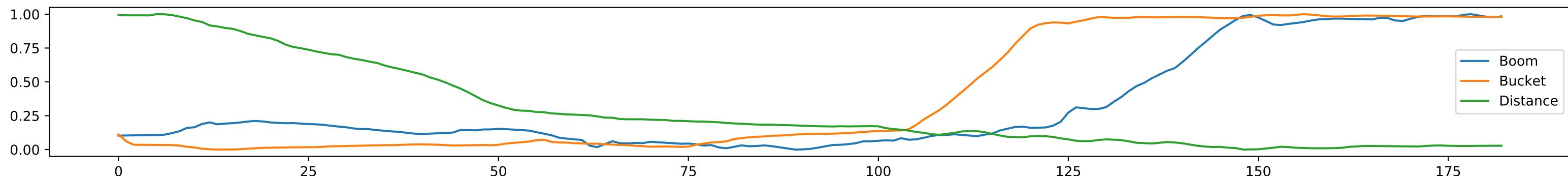
autumn - 16-23-38



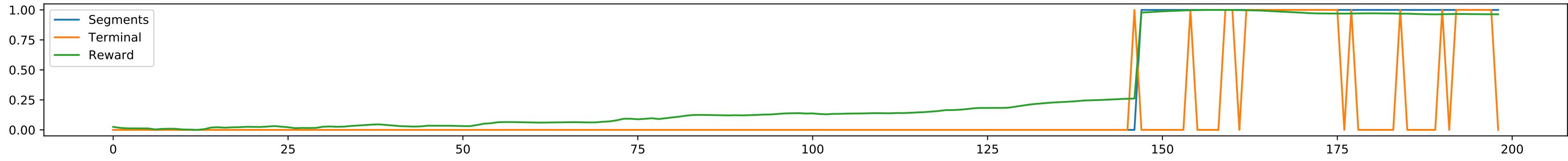
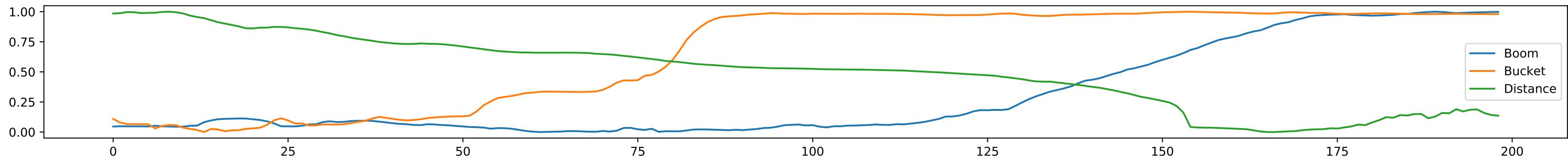
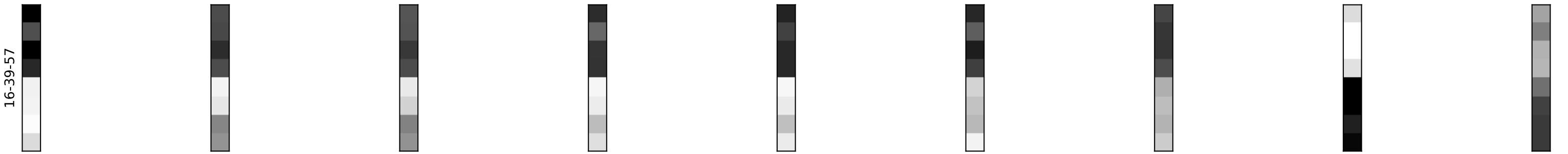
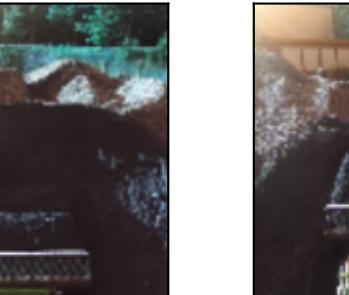
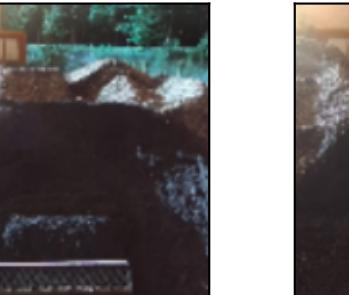
autumn - 19-01-52



19-01-52

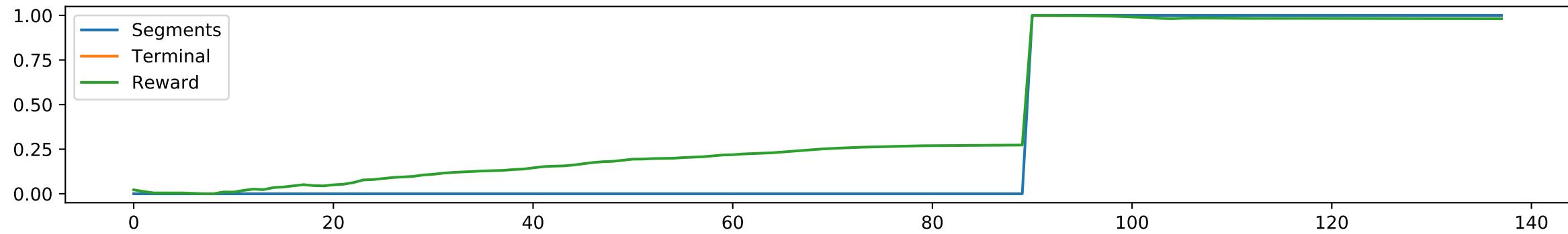
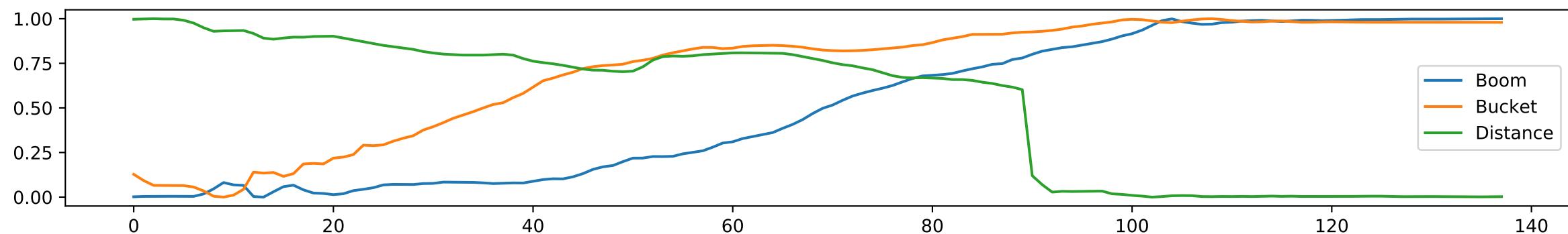
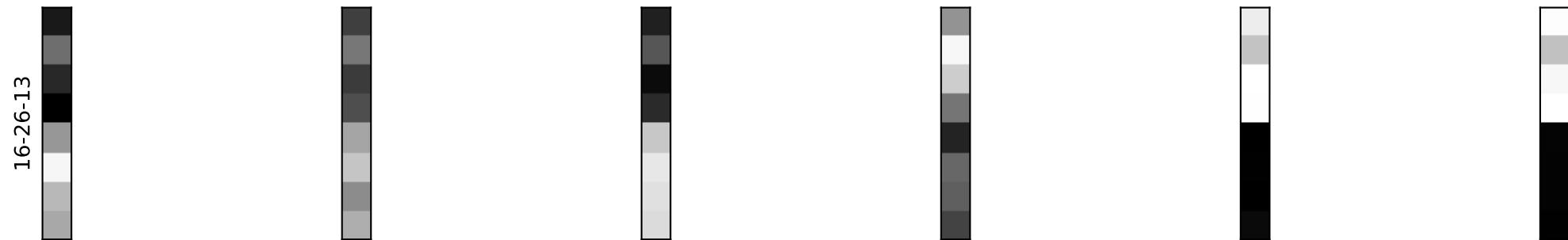


autumn - 16-39-57

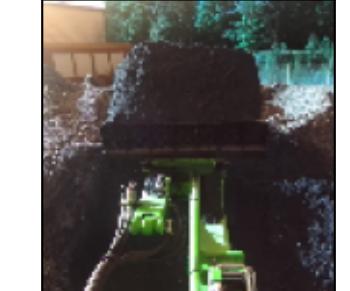
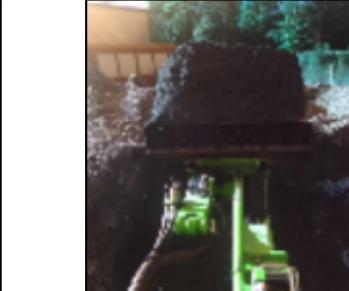


autumn - 16-26-13

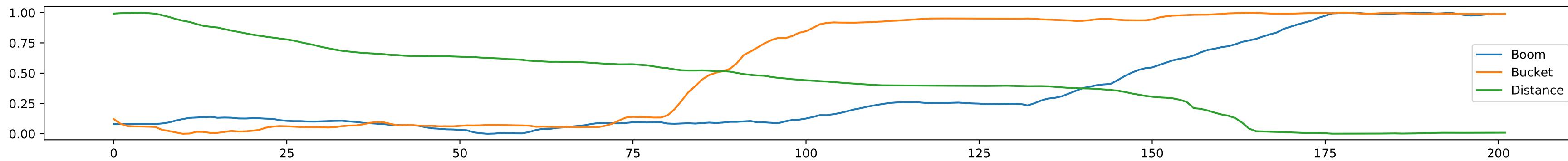
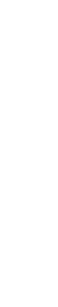
16-26-13



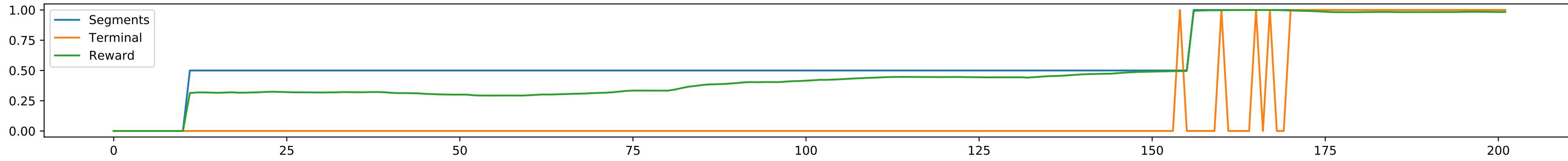
autumn - 16-31-52



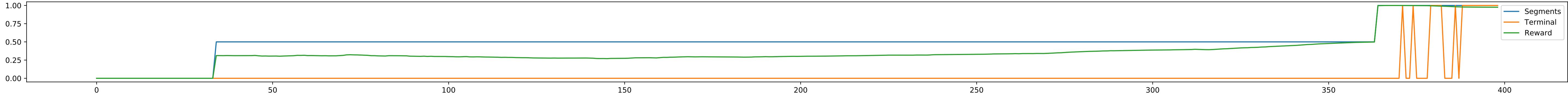
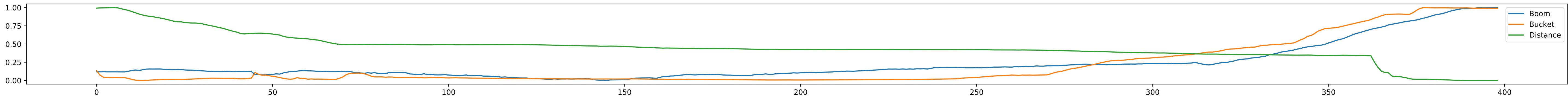
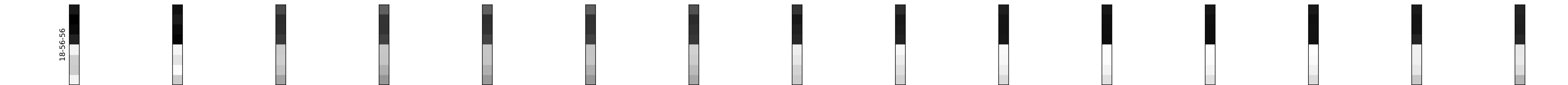
16-31-52



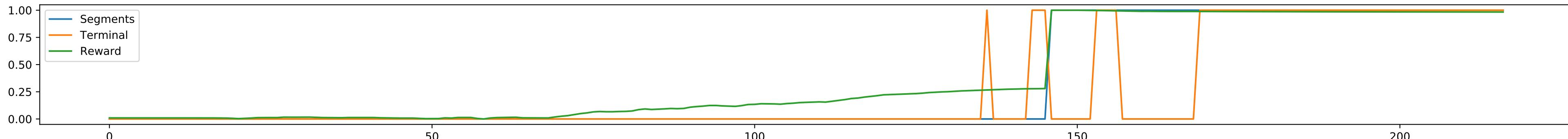
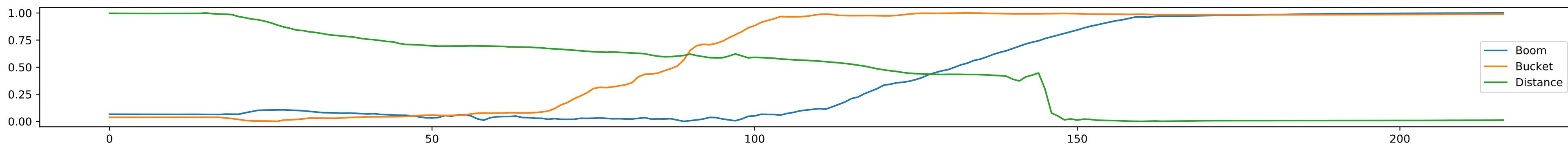
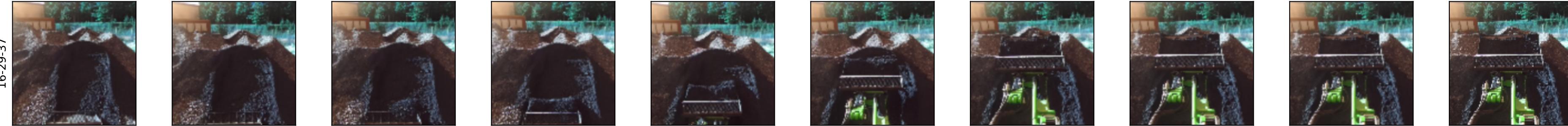
— Boom  
— Bucket  
— Distance



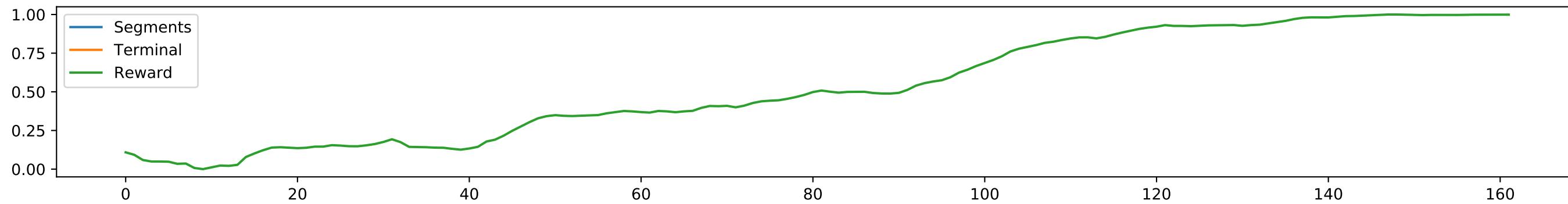
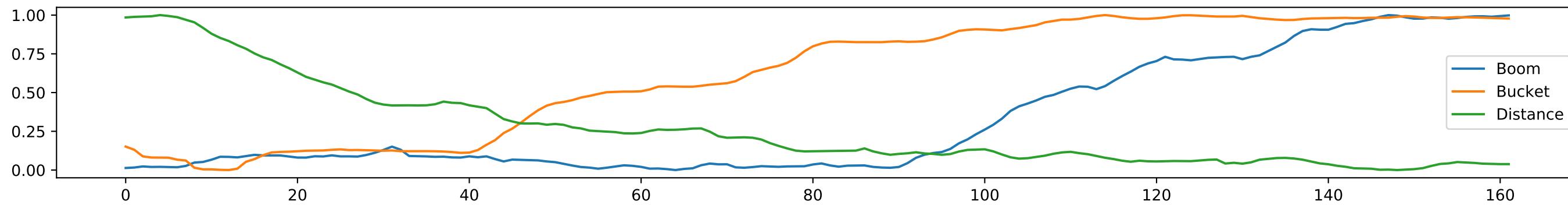
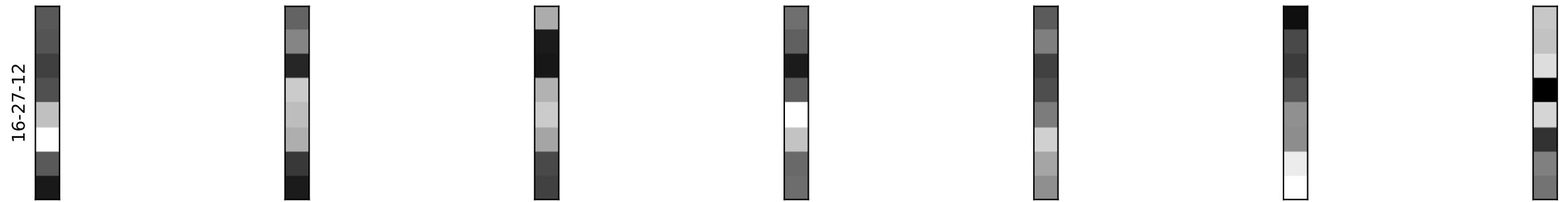
— Segments  
— Terminal  
— Reward



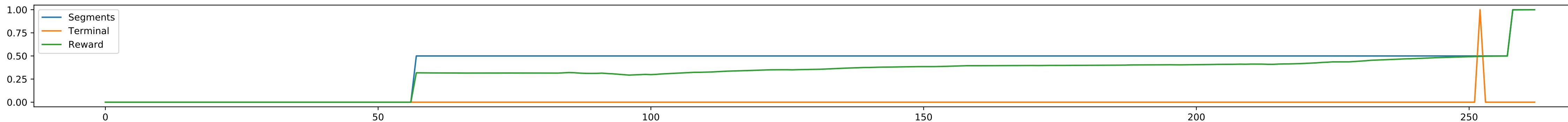
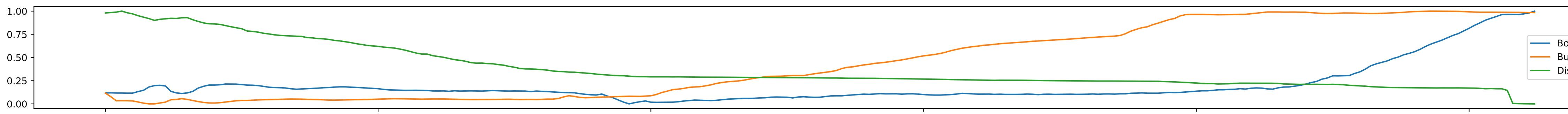
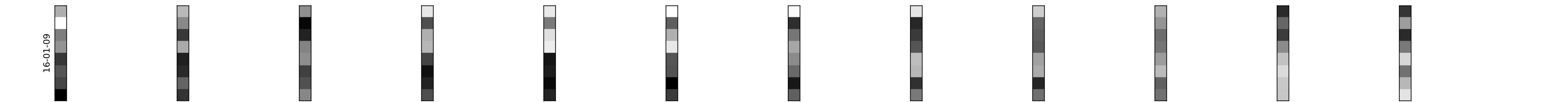
autumn - 16-29-37



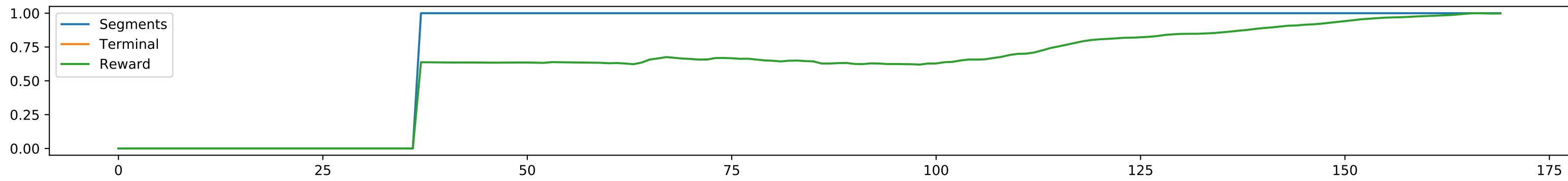
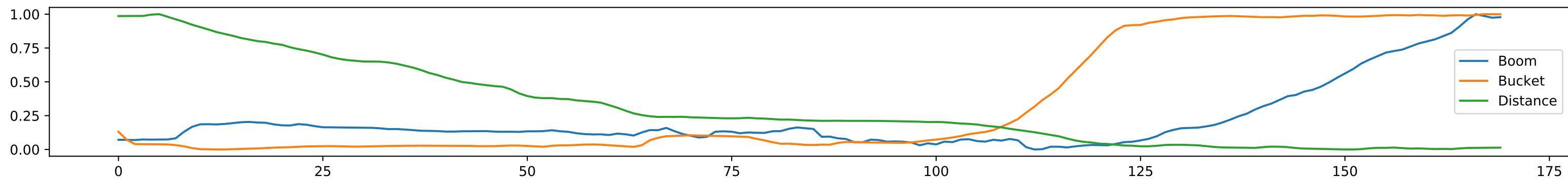
autumn - 16-27-12

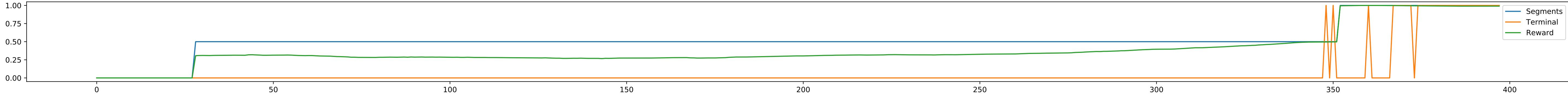
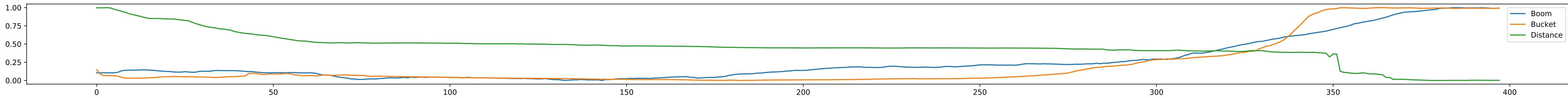
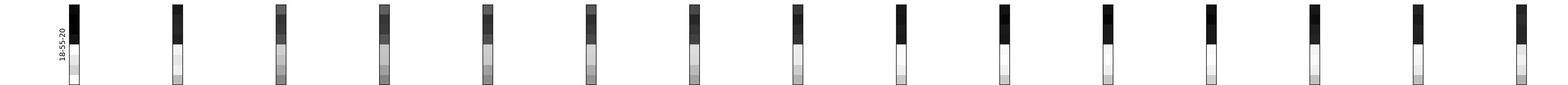


autumn - 16-01-09

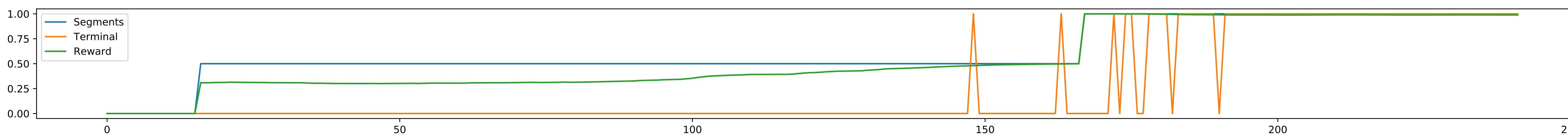
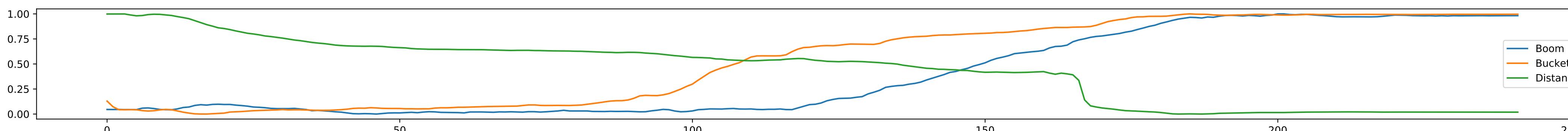
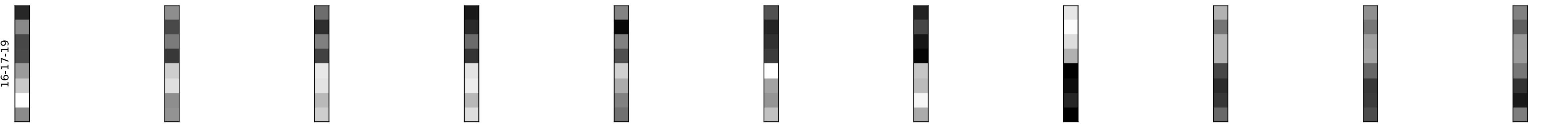


autumn - 18-58-51

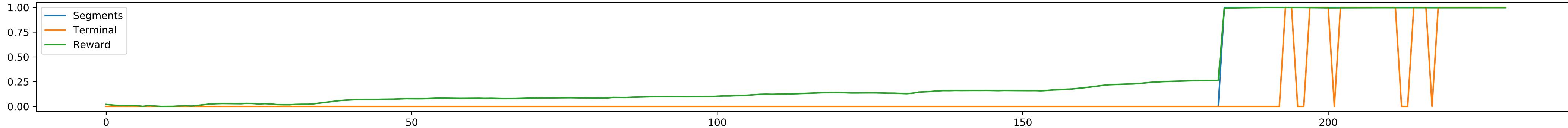
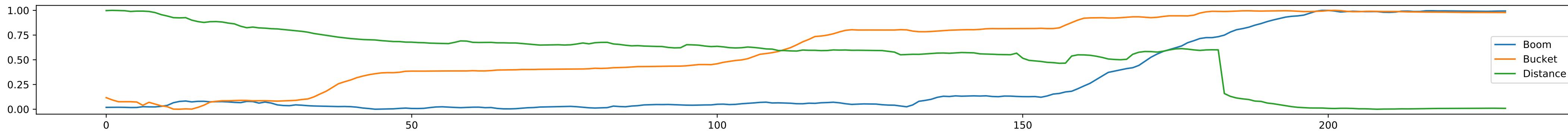
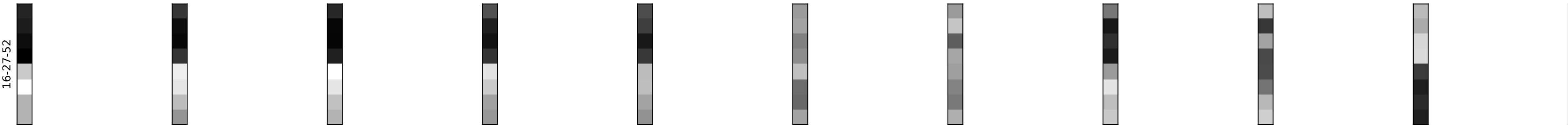
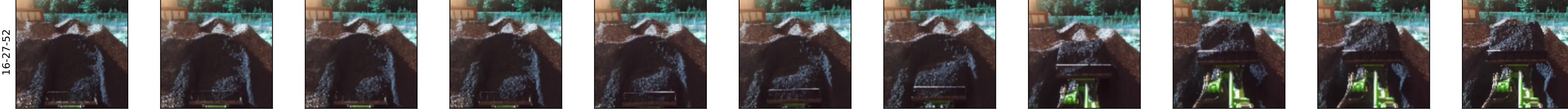




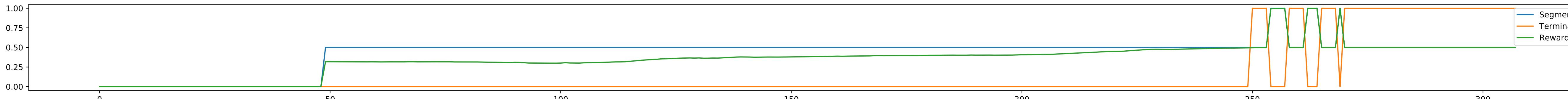
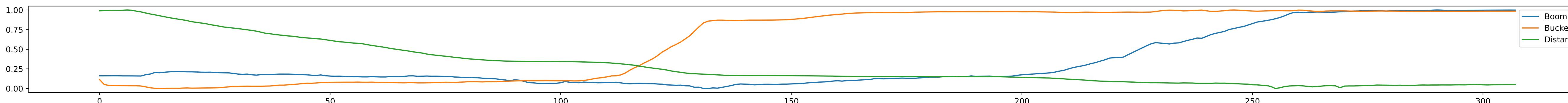
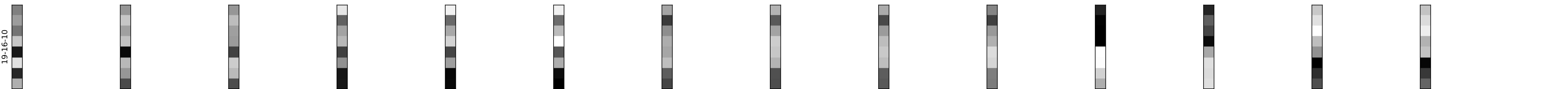
autumn - 16-17-19



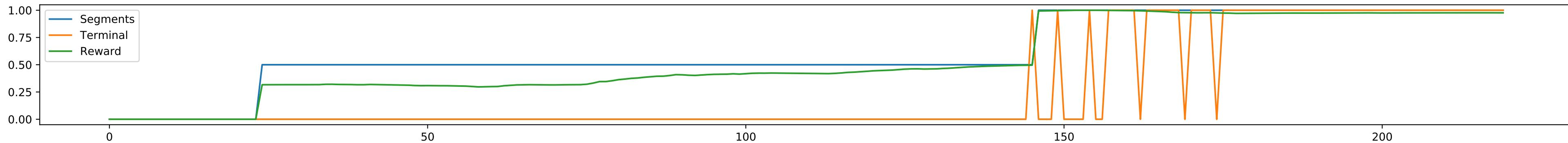
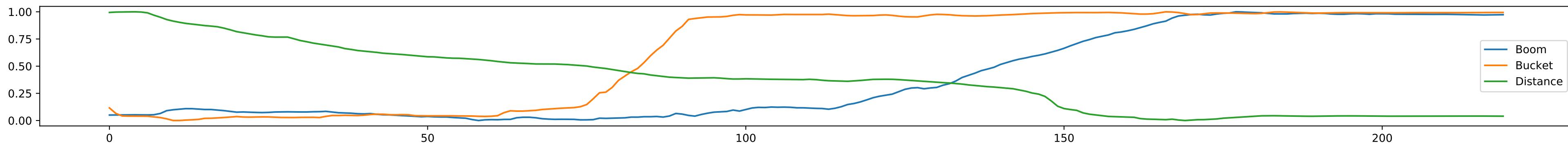
autumn - 16-27-52



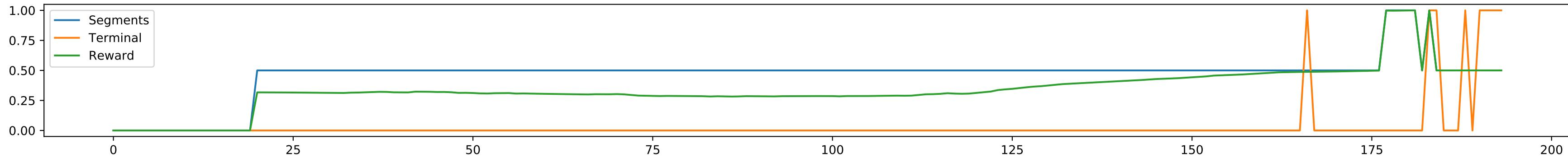
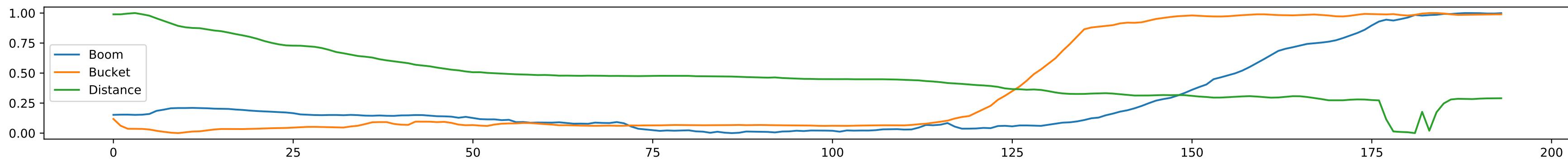
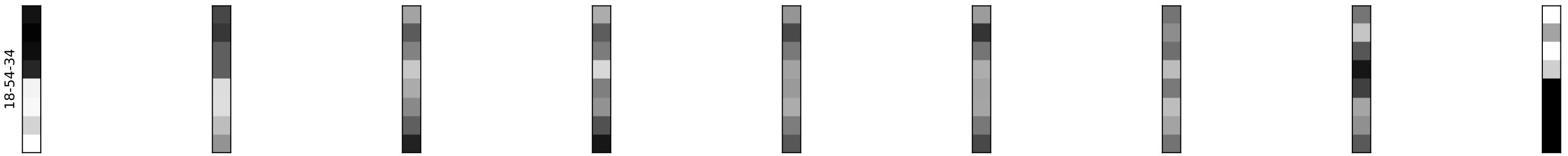
autumn - 19-16-10



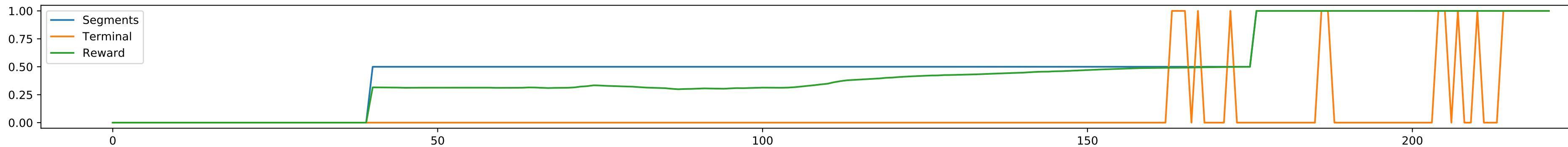
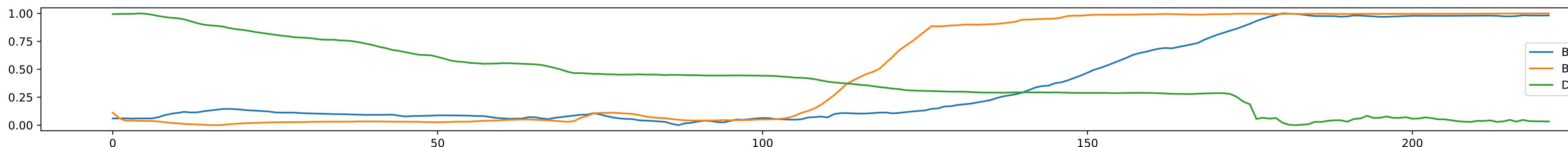
autumn - 16-34-22



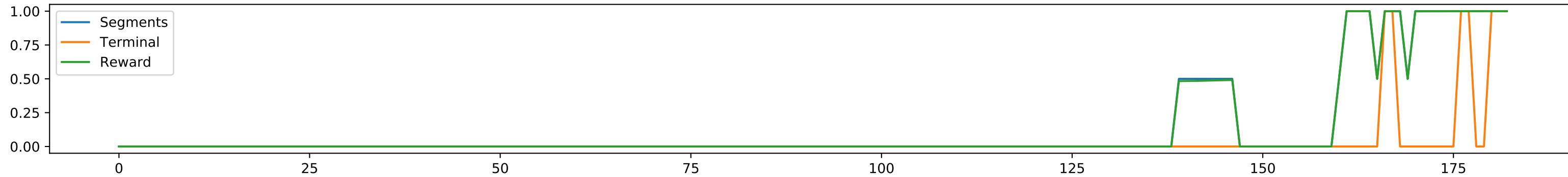
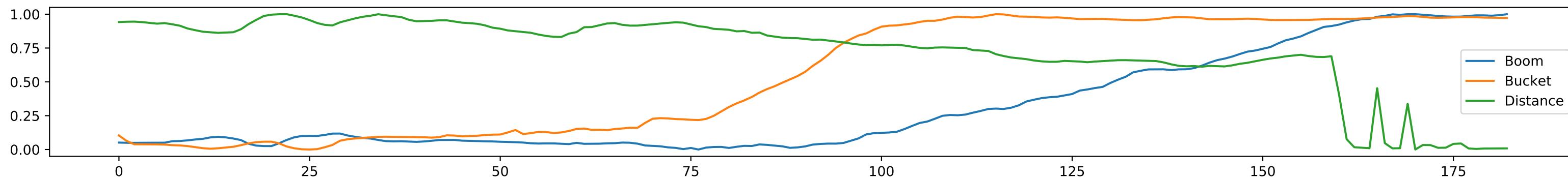
autumn - 18-54-34



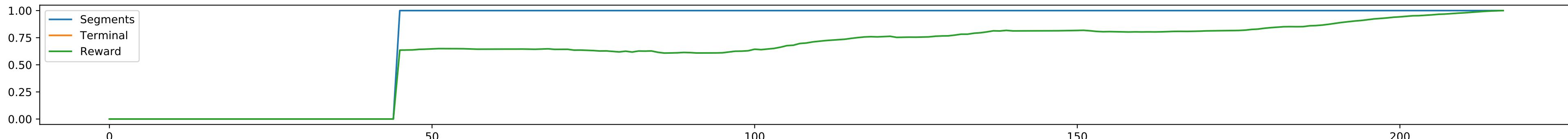
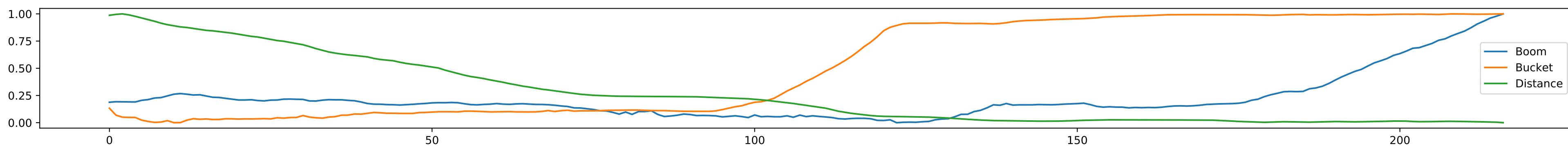
autumn - 18-58-03



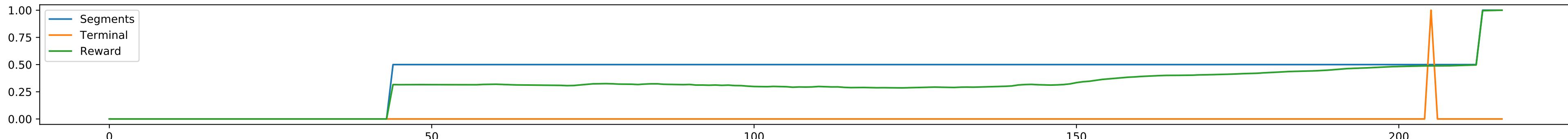
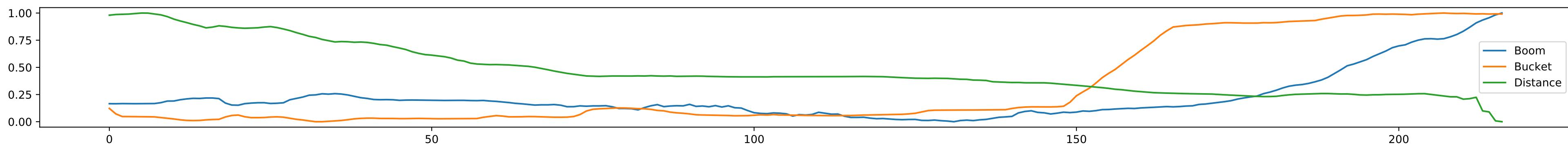
autumn - 16-12-18



autumn - 19-17-30



autumn - 18-59-36

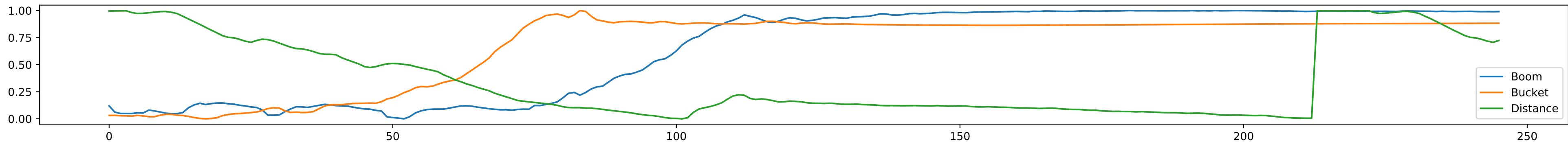
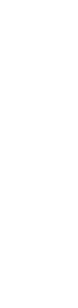


autumn - 18-50-54

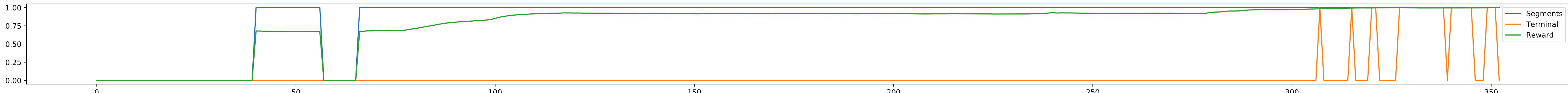
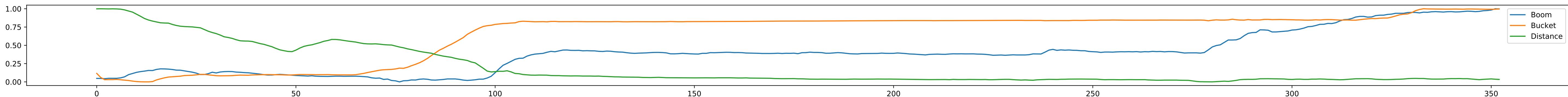
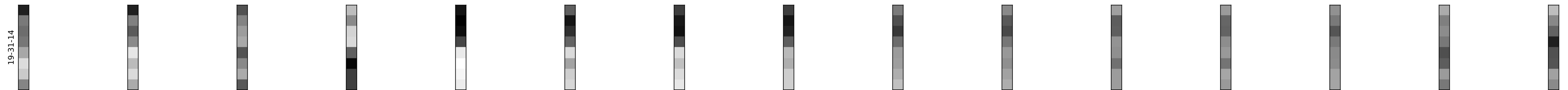
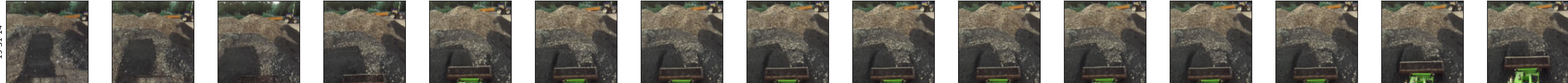
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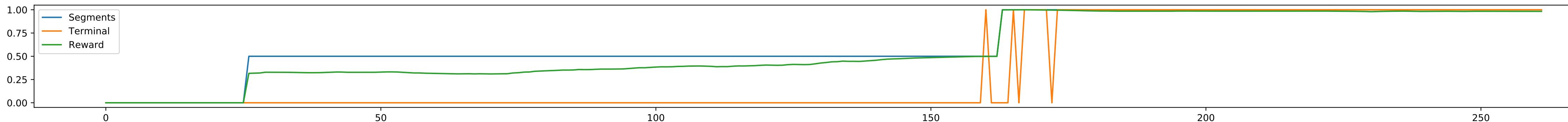
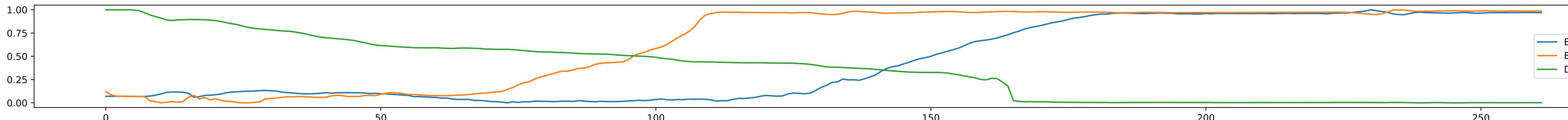
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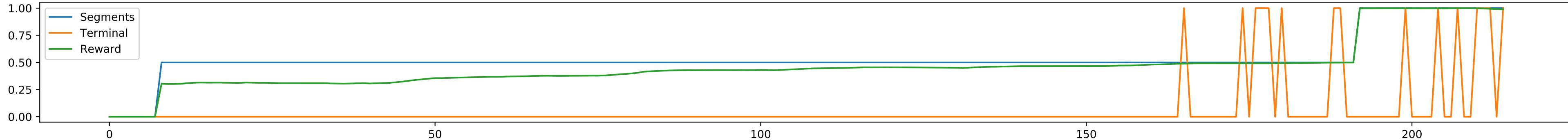
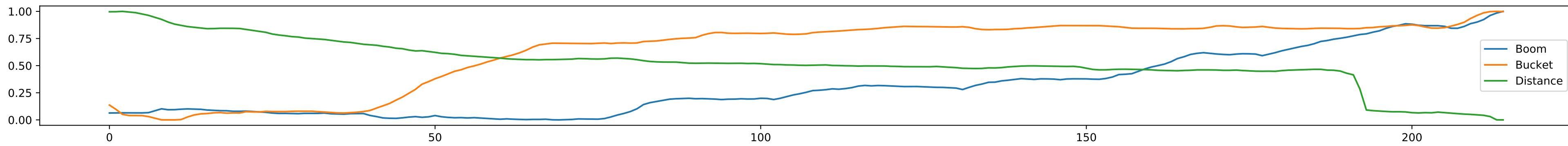
autumn - 19-31-14



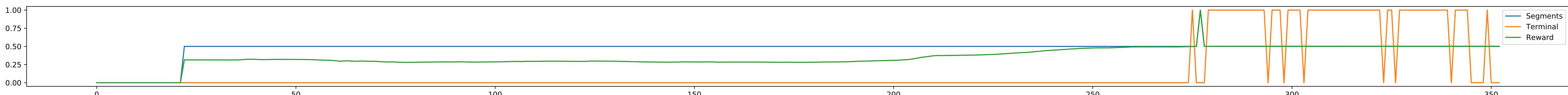
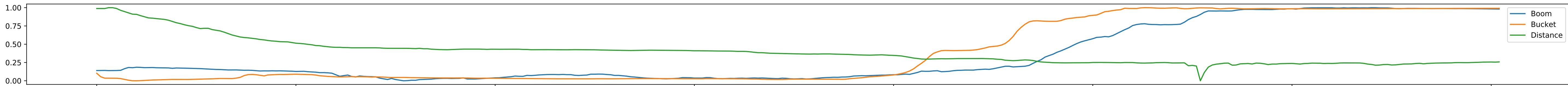
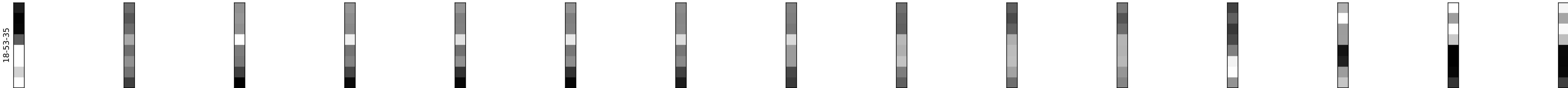
autumn - 16-40-51



autumn - 16-19-28

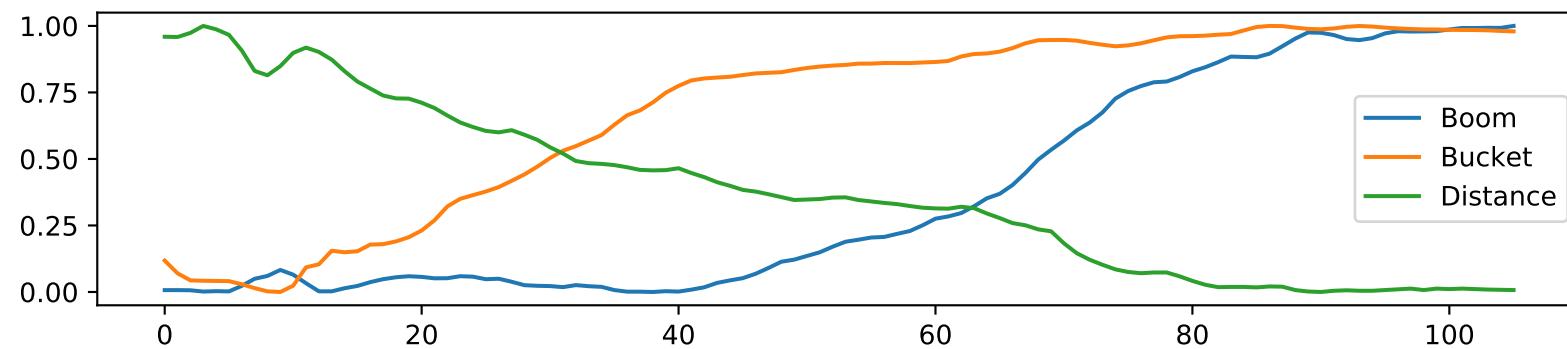
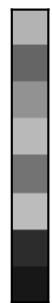
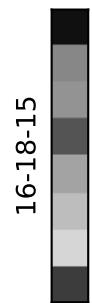
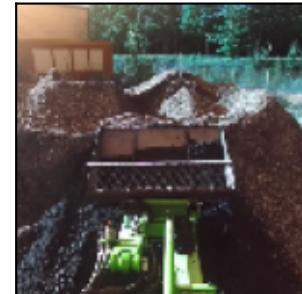
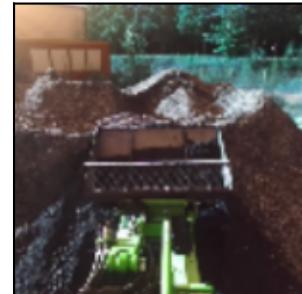
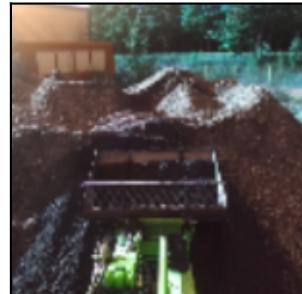


autumn - 18-53-35

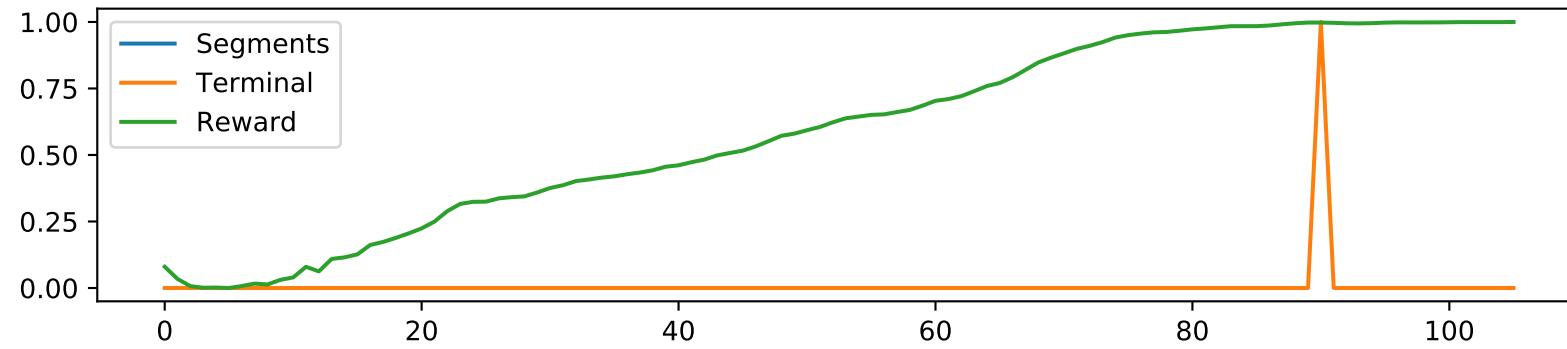


autumn - 16-18-15

16-18-15



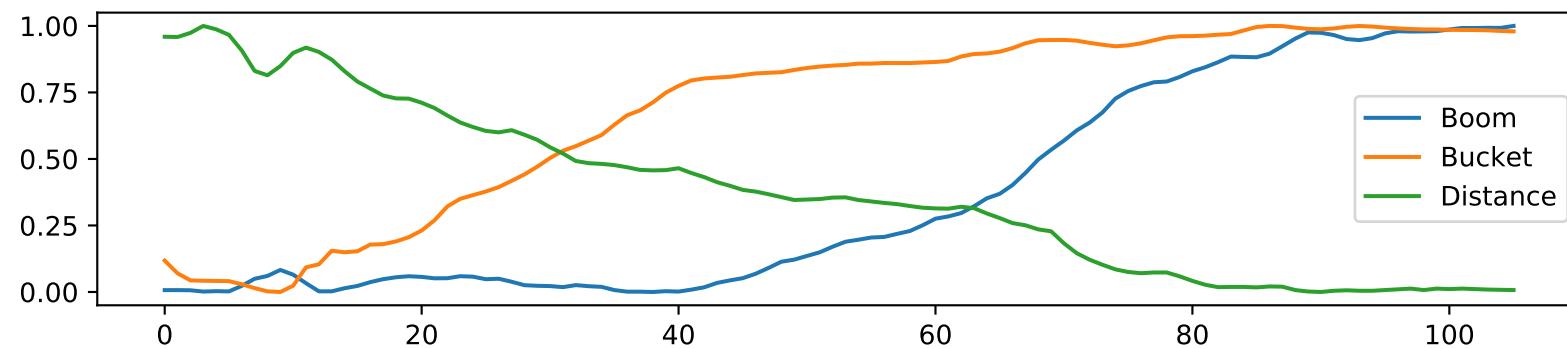
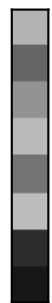
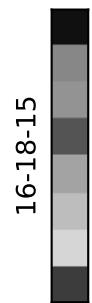
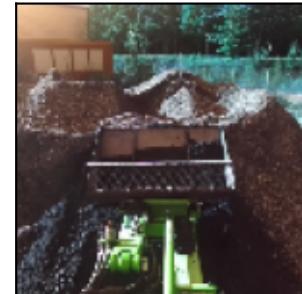
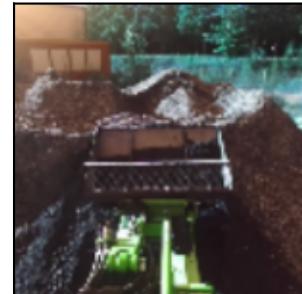
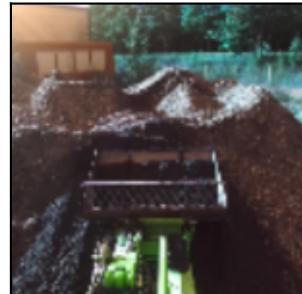
Boom  
Bucket  
Distance



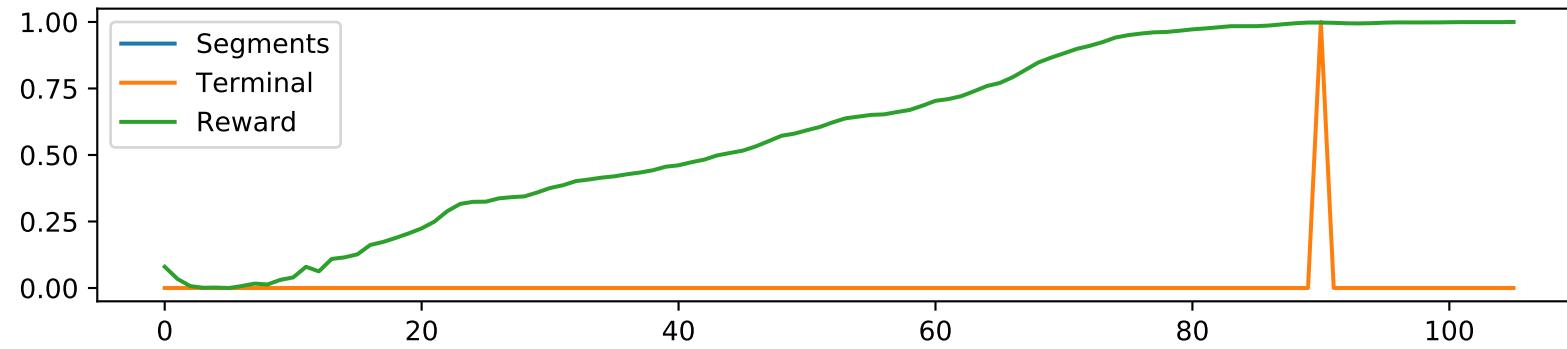
Segments  
Terminal  
Reward

autumn - 16-18-15

16-18-15



- Boom
- Bucket
- Distance



- Segments
- Terminal
- Reward