# Event Prediction:
## Model Implementation and Evaluation

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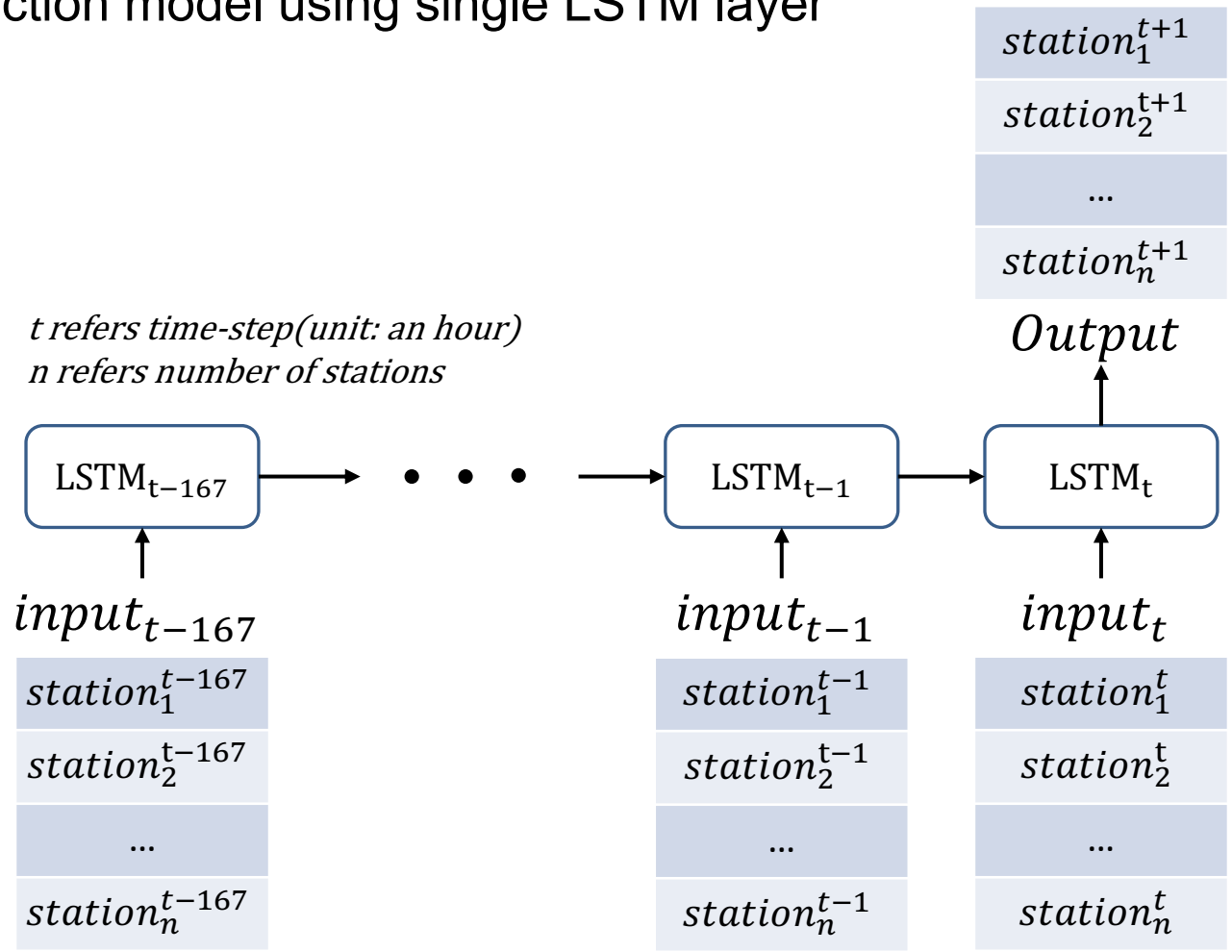
# Presentation Outline

- Chicago Bike Station Dataset
- Model Implementation
- Evaluation
- Future Work

# Implementation

■ A prediction model using single LSTM layer



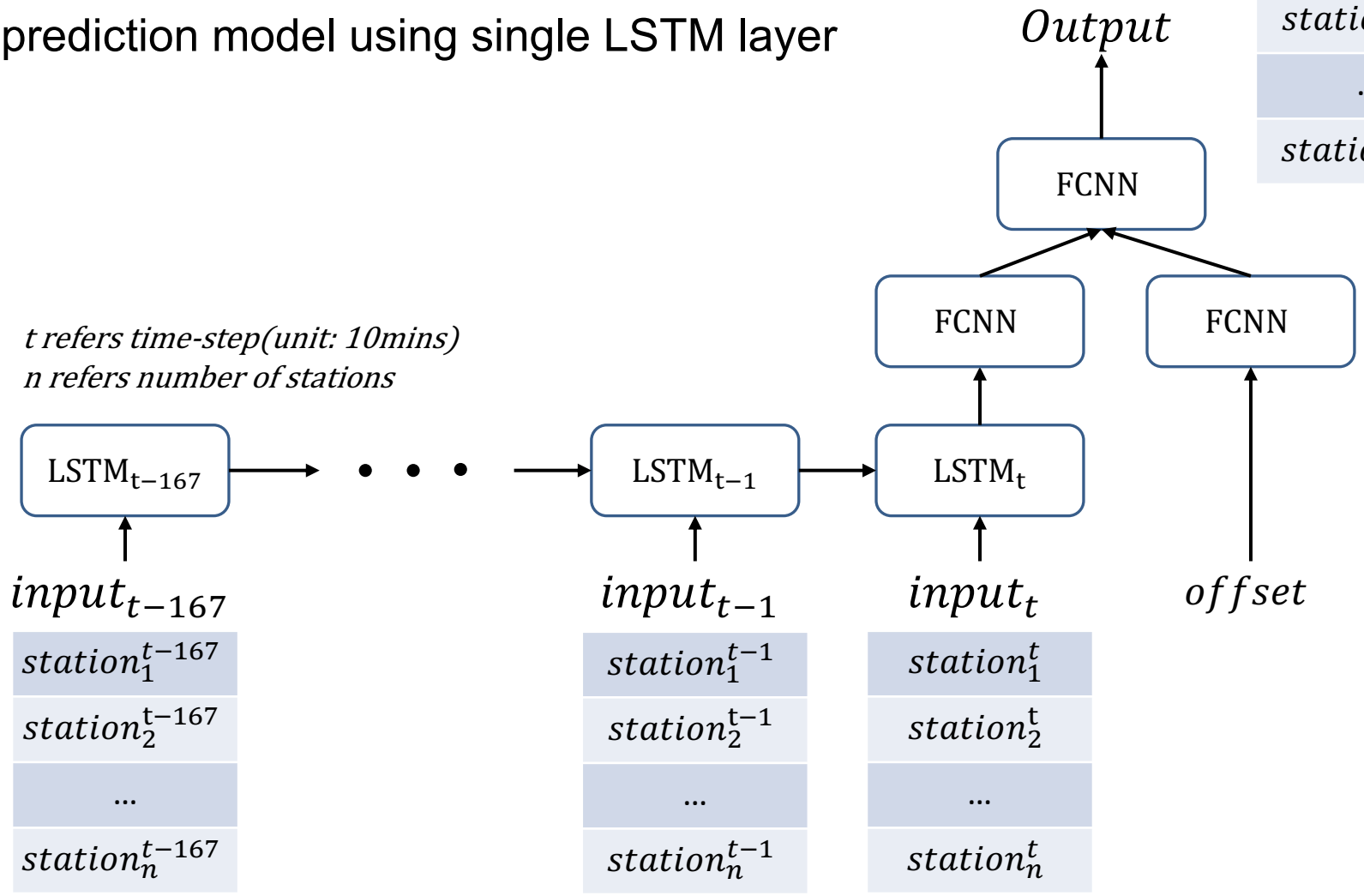
# *Implementation: errors in previous trial*

- A historical station dataset acquires station logs in every 10 mins
- The results in previous seminars are not predictions for the next 1 hour

- Percentage based normalization
  - Input: 1680 mins, Output: 10 mins
  - Hidden dimension(LSTM): 256
  - Accuracy: 93.46
- Max value-based normalization
  - Input: 1680 mins, Output: 10 mins
  - Hidden dimension(LSTM): 256
  - Accuracy: 83.46

# Implementation

■ A prediction model using single LSTM layer



# *Implementation*

- 1008 ($168 \times 6$) time-steps
- Offset up to 2 hours (12 time-steps)

- Overall Accuracy: 94.9% of 3,424,655 test cases
  - under acc(0.08%/94.9%) 2.21% of 128,707 test cases
  - upper acc(0.001%/94.9%) 2.54%  of  3,461 test cases
  - normal acc(94.819%/94.9%) 98.62 out of  3,292,487 test cases

# *Implementation*

- t+1: all acc 81.24
- t+2: all acc 96.13
- t+3: all acc 96.13
- t+4: all acc 96.13
- t+5: all acc 96.14
- t+6: all acc 96.14
- t+7: all acc 96.14
- t+8: all acc 96.14
- t+9: all acc 96.14
- t+10: all acc 96.15
- t+11: all acc 96.15
- t+12: all acc 96.15

# *Future Work*

- Find time period when both historical and trip data are available
- Generate bike transition matrix using trip data
- Add fusion layers in the model to train the matrix with historical data