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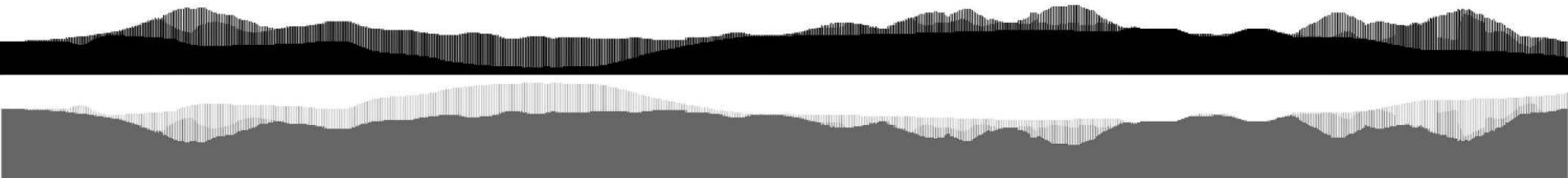
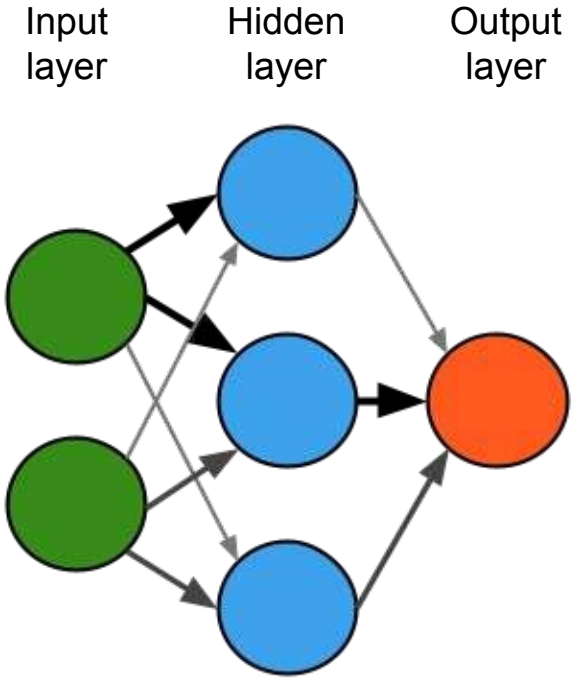
Identifying Musical Instruments with Machine Learning

Thomas Burg



Background



A Simple Neural Network

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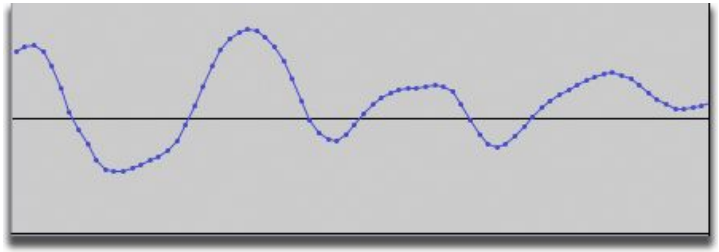
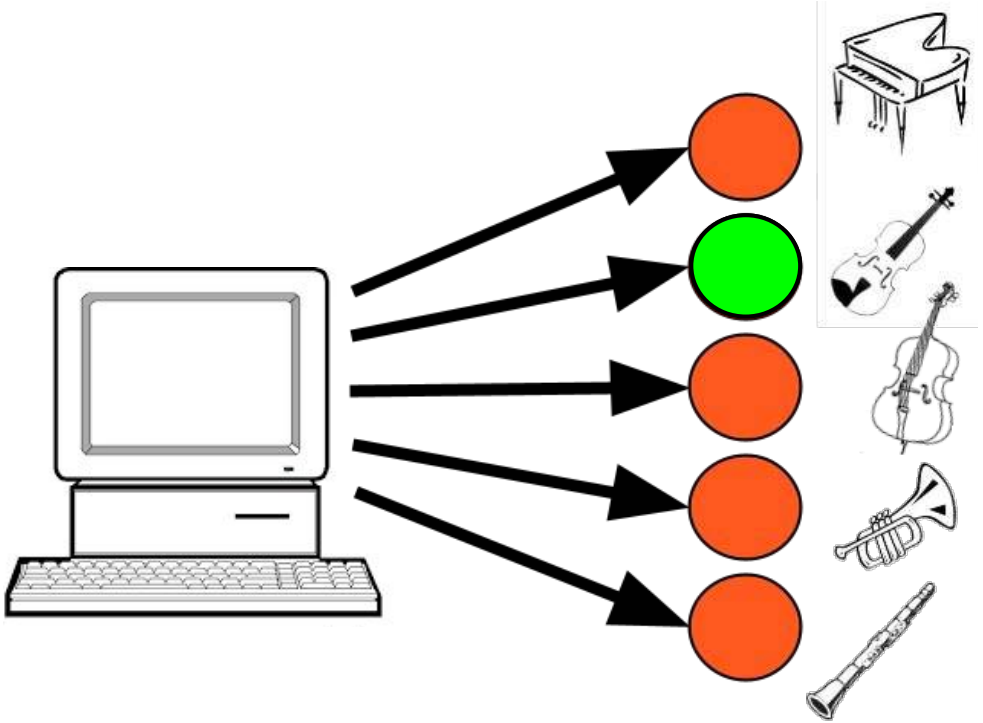
Related Works

- Instrument Recognition using Convolutional Neural Networks
  - (Solanki, A., Pandey, S., 2019)
- Polyphonic Instrument Identification using Convolutional Neural Networks
  - (Y. Han, J. Kim and K. Lee, 2017)

Project Overview





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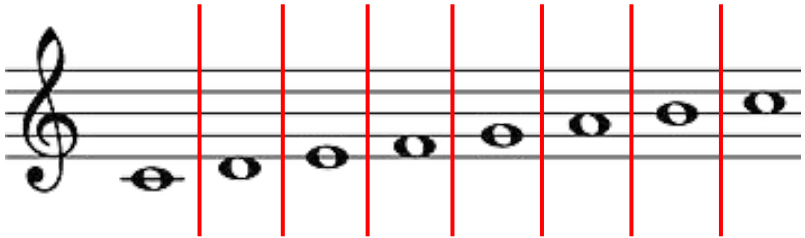
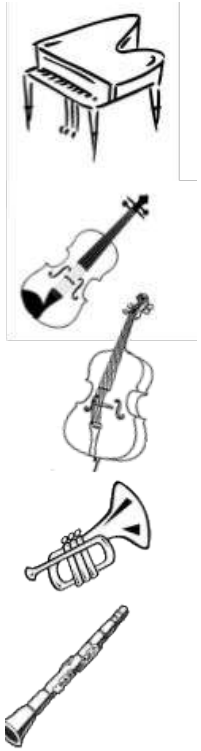
Data Preparation





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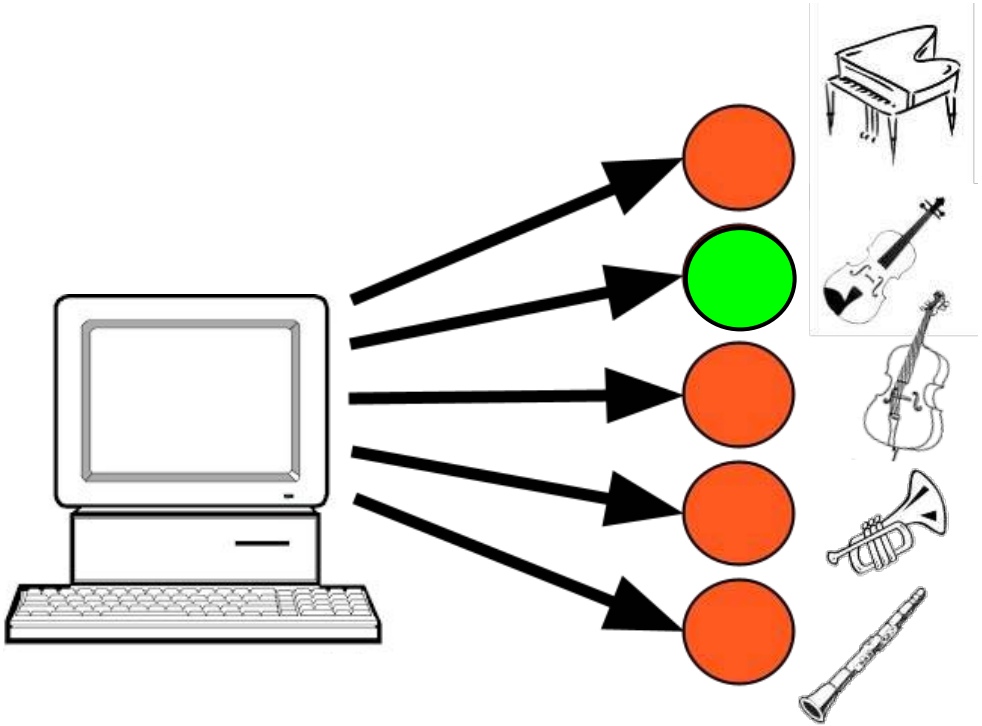
Model Design

- 74,309 Trainable Parameters
- Bi-Directional LSTM
- Learning Rate: 0.0001



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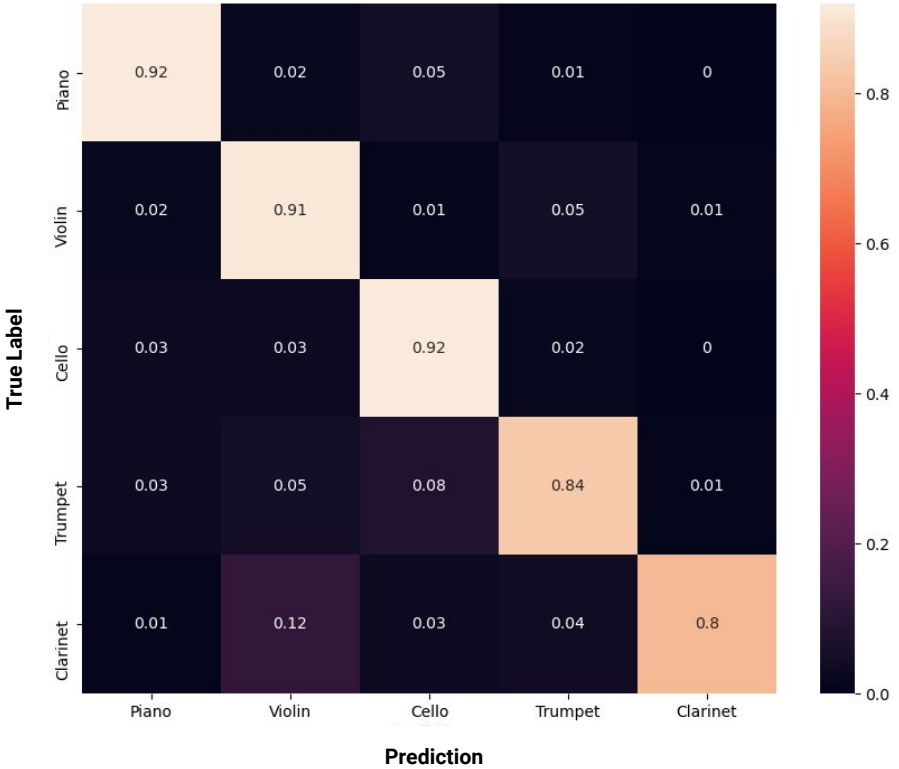
Results

- 90% Accuracy
- 0.89 F_1 Score
- 55 minute training time
- 150 epochs



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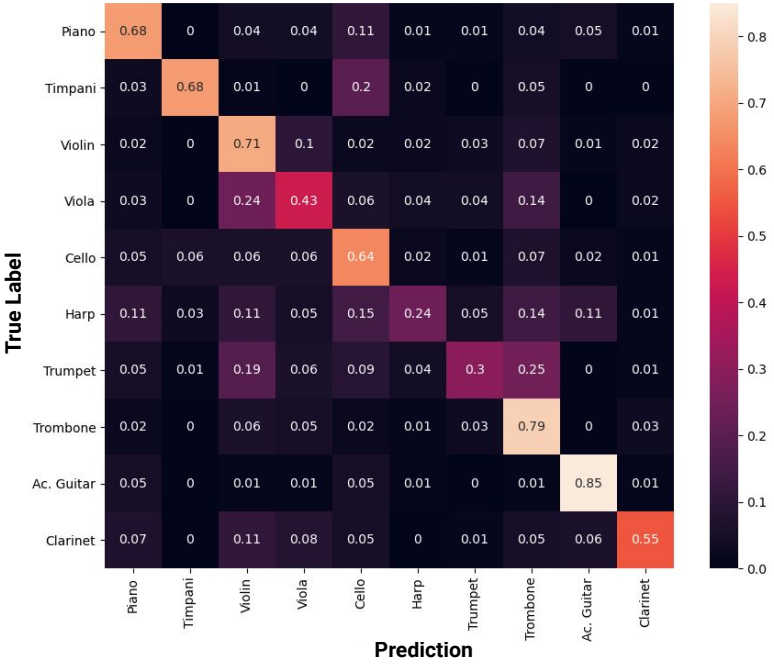
Moving Forward



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References

1) Solanki, A., Pandey, S. Music instrument recognition using deep convolutional neural networks. *International Journal of Information Technology* (2019). https://doi.org/10.1007/s41870-019-00285-y

2) Y. Han, J. Kim and K. Lee, "Deep Convolutional Neural Networks for Predominant Instrument Recognition in Polyphonic Music," in *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 25, no. 1, pp. 208-221, Jan. 2017, doi: 10.1109/TASLP.2016.2632307.

3) RWC Music Database - https://staff.aist.go.jp/m.goto/RWC-MDB/

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