Art Appraisal Using Convolutional Neural Networks
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Abstract
In order to provide a standardized method of appraising artwork, we suggest the use of a convolutional neural network (CNN). We constructed a CNN using the framework of TensorFlow that takes in as inputs the three RGB channels of a given artwork. We gathered the images of about 100,000 artworks along with associated metadata (artist name, sell price, medium, etc.). After training various CNN architectures, it is apparent that a CNN without the name of the artist is unable to achieve any meaningful accuracy.

Data
- 100,000 400x400 RGB images of artwork scraped from findartinfo.com
- Each piece was paired with metadata (artist name, dating, sell date, sell price, medium, signed)

Features
- CNN: 3D tensor of RGB values (float32) for each artwork
- Logistic Regression: Artist Name, Medium, Age of painting, Signed/Not signed

Models
- CNN: 3 convolutional/pooling layers, 2 fully connected layers, Slight variations on the above (bin sizes, +/- 1 layer), AlexNet
- Logistic Regression: $Wx + b$, Softmax

Results
Our trained CNN models consistently underperformed on our validation and test sets. The predictions were essentially random, with the accuracy directly influenced by the size and number of our output bins.

References

Future
- Future avenues of approach include using the same models to classify subsets of the full dataset (e.g. classifying all work by one artist or all pieces rendered in the same medium).
- In regards to the logistic regression approach, ablative analysis of the metadata features used would indicate the most relevant features for sell price classification.