What’s That Rash

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Problem Statement

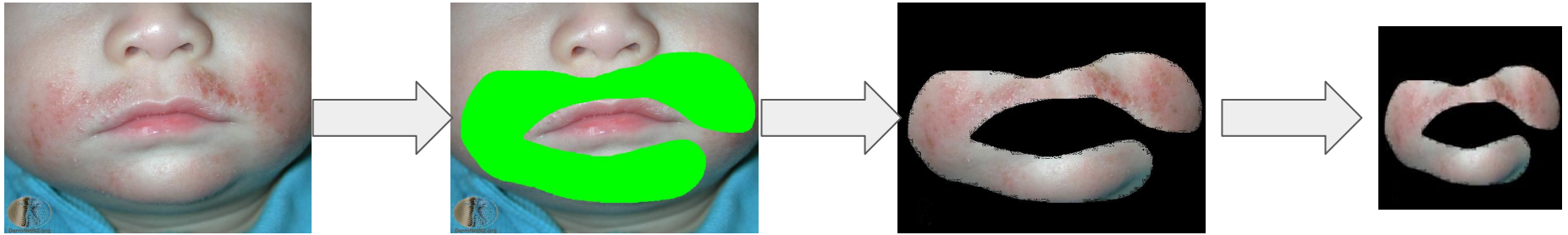
Rashes are prevalent, but how do you determine when to visit a dermatologist?

- We will use disease features and Neural Nets to classify the disease.
- User benefits by:
  - Promoting further research into the skin condition
  - Providing confidence in predicting skin condition
- App is hosted online, requires an image of the rash, and takes seconds to run

This app can classify the skin rash classification within these common skin diseases

Data Gathering and Preparation

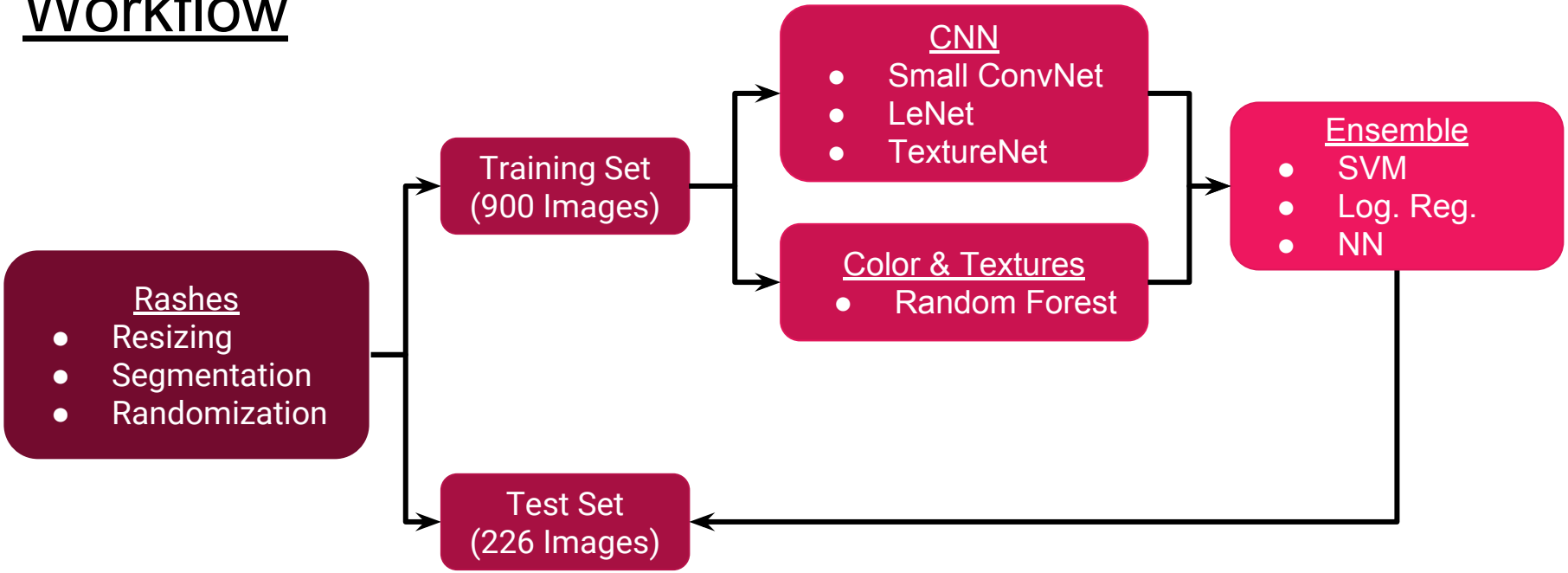
Segmentation ROI Extraction Standardization



Smaller and Square

- Data gathering/preprocessing:
  - Total number of images = 1126
- Data integrity checks
  - Looked for distinguishing features
- Feature engineering
  - Converted categorical features (color and textures) were encoded into dummy variables
- Standardization
  - Standardized all images to 200x200 pixel resolution

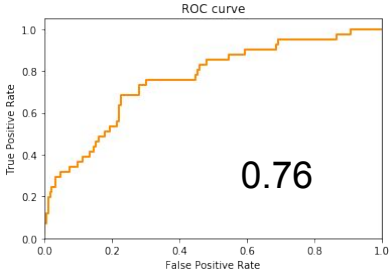
Workflow



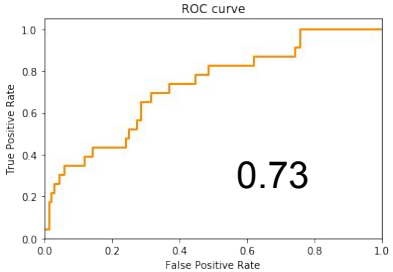
Compared SVM, Multinomial Logistic regression, and Neural Net

Results - AUC ROC

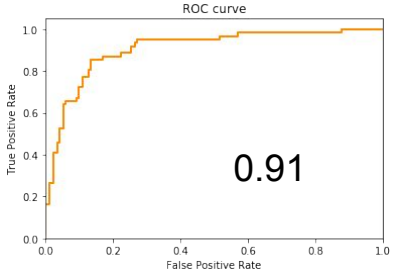
Atopic Dermatitis



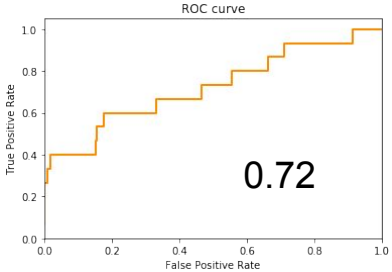
Contact Dermatitis



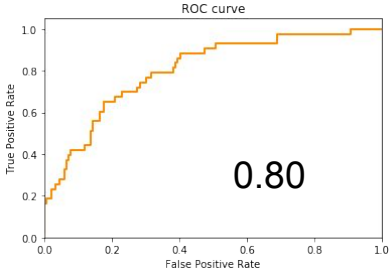
Melanoma



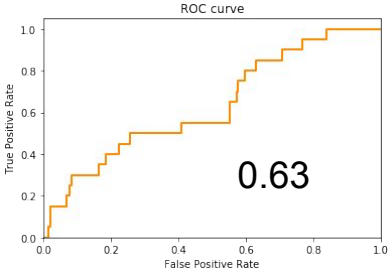
Melanoma Mimic



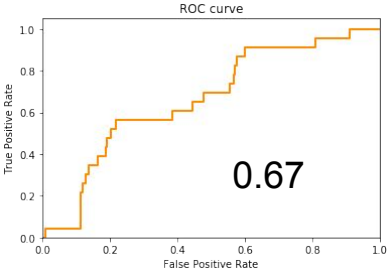
Christmas Tree Rash



Psoriasis



Ringworm



Conclusion

SVN Model Achieves mean AUC ROC of 74.5%:

- Variability within same disease


- Noisy background (i.e. clothes)


- Different scales (mm vs m)


- Small sample size
  - 900 images Training
  - 226 images Test

WebApp

http://WhatsThatRash.pythonanywhere.com/

Repository: https://github.com/jcp2203/WhatsThatRash