Julia Gong
JMP

About Me

- **Rising Senior** at Cary Academy
- **2016 SAS** Summer Intern in JMP reporting to Diana Levey, mentored by John Ponte, Dan Valente
- **Goal**: Internship in analytics that combines computer science, image analysis, statistics, and linguistics skills

Projects

- Developed software that builds models for separating skin cancer images from benign growths
- Will present a poster on skin cancer software at 2016 JMP Discovery Summit
- Created various image analysis scripts
- Improved data collection methods for JMP documentation

Other Science Projects

- Date rape drug detection (winner of international Bluetooth and Dell competitions)
- Applied Ecology research on determining new species of scale insect (paper presenter at NCJSHS symposium)
- Modeling metropolitan city data (COMAP Math Modeling Contest)

Training / Learning

- **Self-Study**: JMP Scripting Language (JSL), AP Computer Science, Java, C#
- **Training** on JMP Statistical Modeling with Team
- **SAS Course**: SAS University Edition
- **College Courses**: MIT Differential Equations, NCSU Multivariable Calculus

Contact Info

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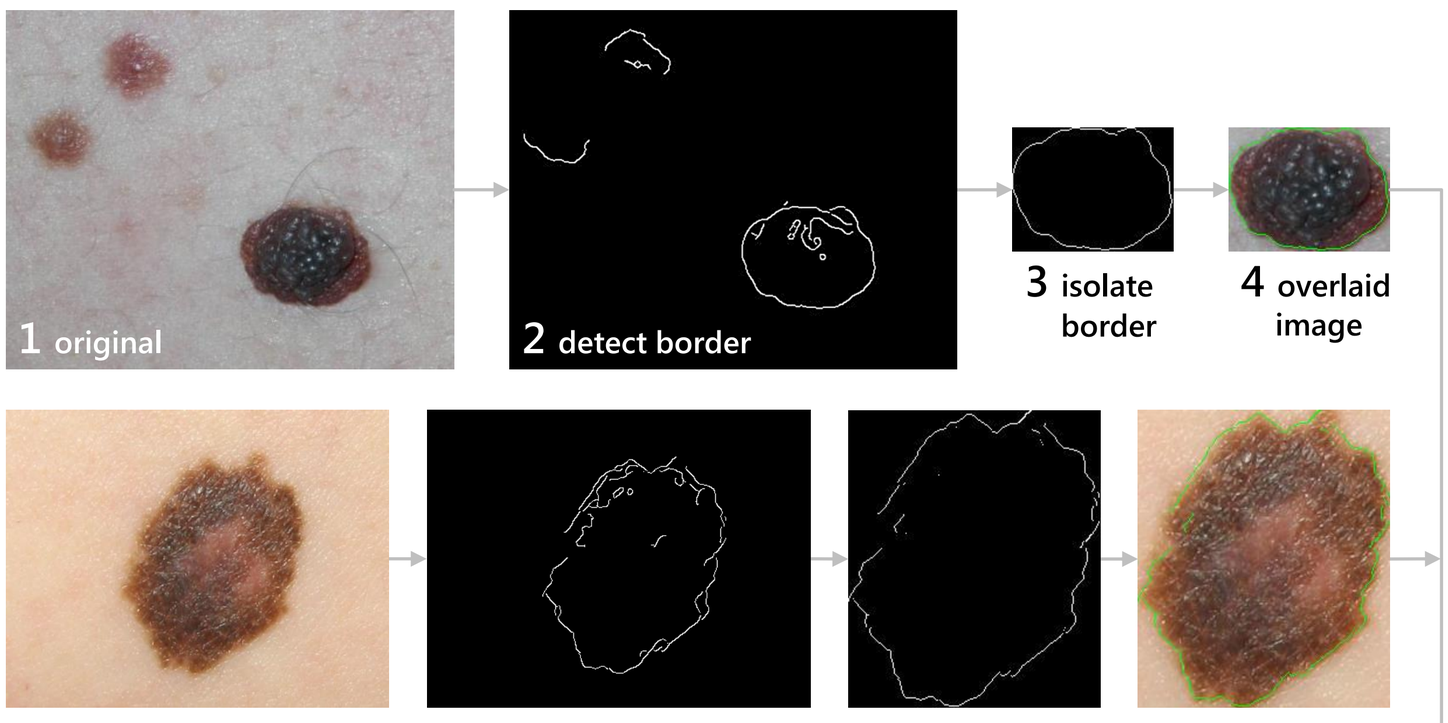
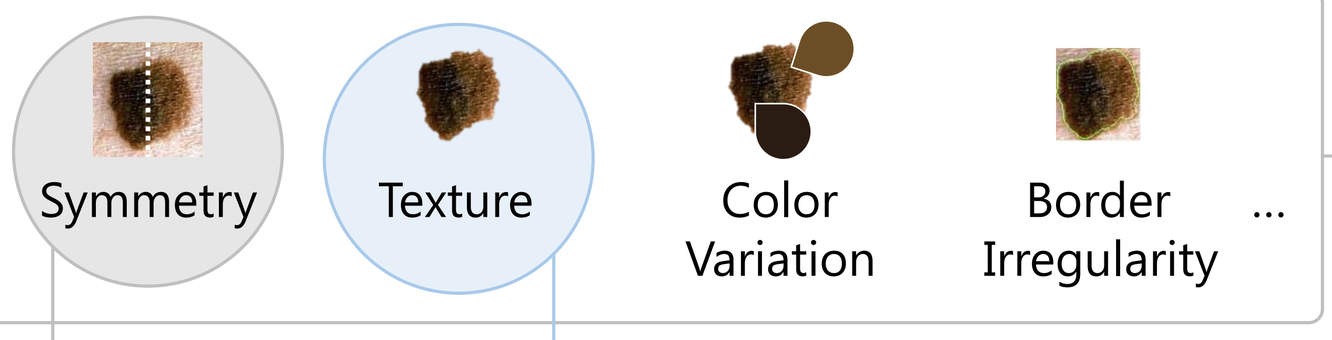
Image Analysis and Modeling for Skin Cancer Detection

My goal was to develop a JMP software plugin for separating skin moles from cancerous growths. Automated image segmentation and analysis extracted characteristic metrics from images, such as texture, symmetry, border irregularity, and variation of color, hue, saturation, luminance, and intensity. The results will contribute to early detection and more reliable identification of skin cancer.

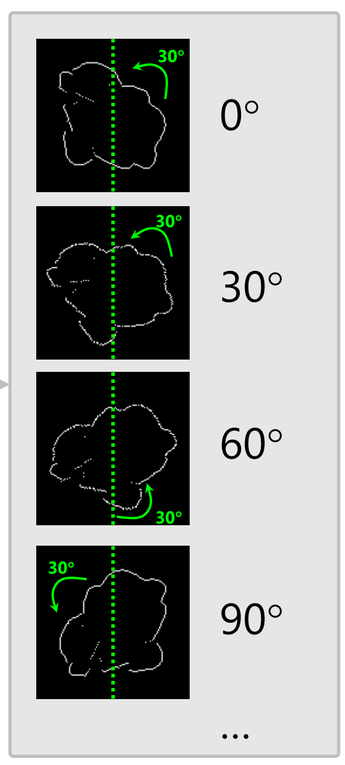
Image Processing (isolate lesion and outer border)



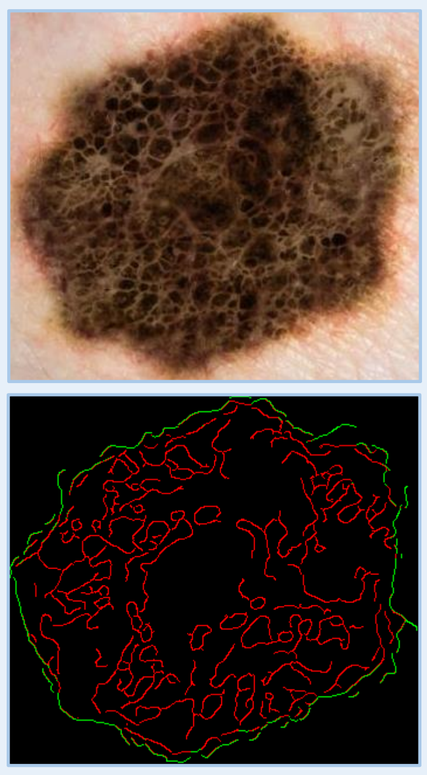
Variables (4 of 49)



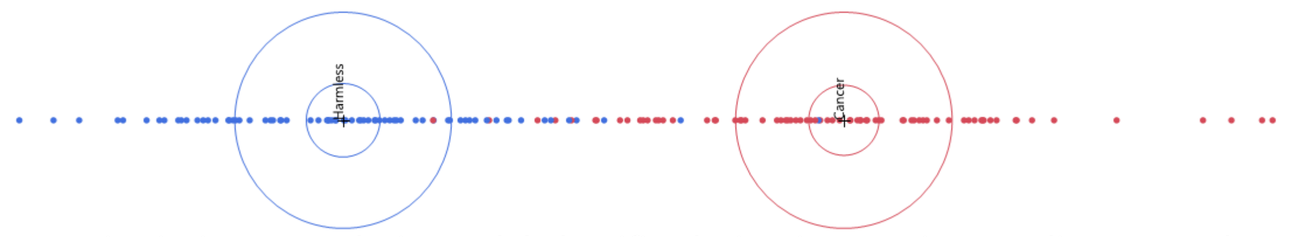
Symmetry Analysis
(30-degree rotations)



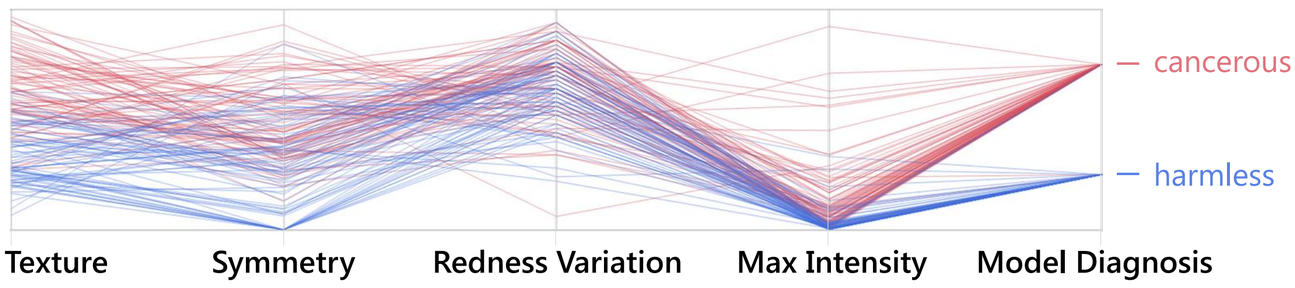
Texture Analysis



Modeling and Analysis



Discriminant analysis model classifies lesion images into malignant and benign based on calculated metrics from above algorithms



Parallel plot of 4 most significant variables that contribute to final diagnosis

Model accuracy: 95% correct classification with 153 samples
Future research: increase sample size, obtain patient survey data for more input variables, use machine learning to improve accuracy