CLOUD-BASED PERSONAL SCP (SKIN CANCER PREDICTOR)

GROUP NAME: LOTAD.AI
INTEGRANTS: GIRINDRA WARDHANA, XIANGSHUAI ZENG, YANI MANDASARI, YOEKO XAVIER, SANTIAGO SANCHEZ-ESCALONILLA PLAZA

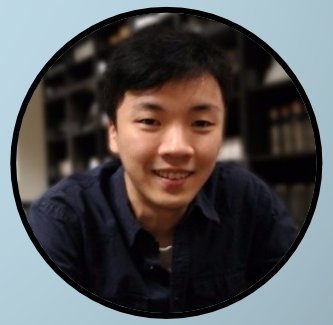
school of ai

LOTAD.AI: WHO ARE WE?

Girindra W.
PhD Candidate in
Computer Vision
University of Twente

Xiangshuai Z.
Systems & Control
MSc Student
University of Twente

Yani M.
Human Media Interaction
MSc Student
University of Twente



Yoeko X.
PhD Candidate in
Optimal Control
University of Twente

Santiago S.
Systems & Control
MSc Student
University of Twente

PROBLEM STATEMENT

CLOSE THE GAP BETWEEN
state-of-the-art AI algorithms ↔ real usage in clinical practice

Guidelines:
Any public dataset, any machine learning tools.

Project proposal:
Fast & portable skin-condition prediction for early cancer detection.

Motivation:

- Skin cancer is the most common cancer in the US*
- 9,500 people in the US are diagnosed with skin cancer every-day*

* America Academy of Dermatology | Association

PROJECT PROPOSAL

Approach:
Web-based application that allows the user to upload a photo of a skin mole for a quick diagnose that can serve as a reference for further medical assessment.

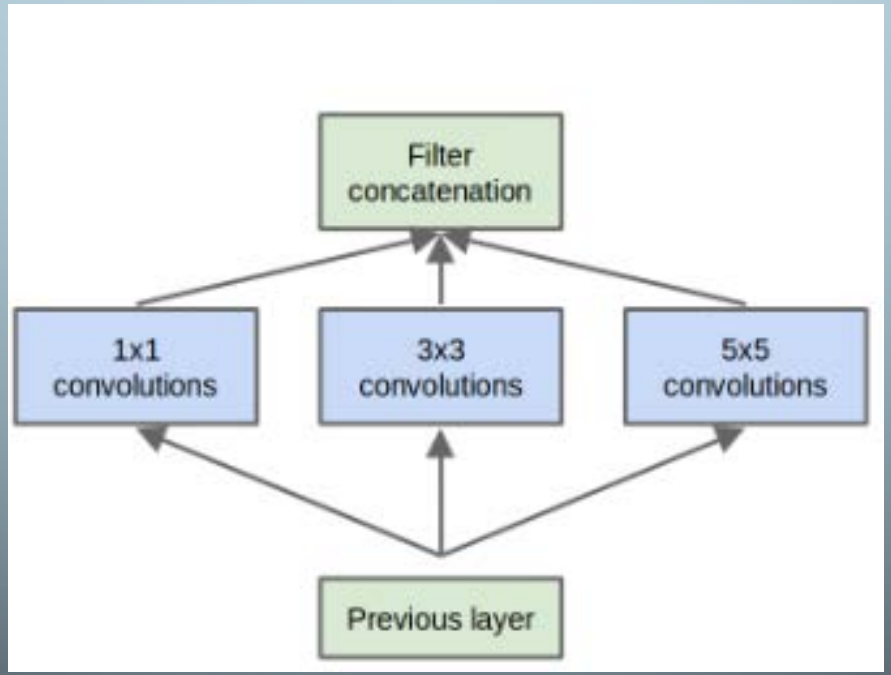
How does it fit into AI?: Back-end Image Classification algorithm (Google-net).

Resources used:

- Dataset: 2018 ISIC Challenge
- (https://challenge2018.isic-archive.com/task3/)
- Framework: MATLAB & Deep Learning Toolbox
- Web-development: HTML, CSS, PHP

NEWTWORK SELECTION (GoogleNet)

- Pretrained network is available in MATLAB
- Inception Layer: cover a bigger area but also keep a fine information for small detail on the image
- 22 Layers in total, high accuracy with faster training time



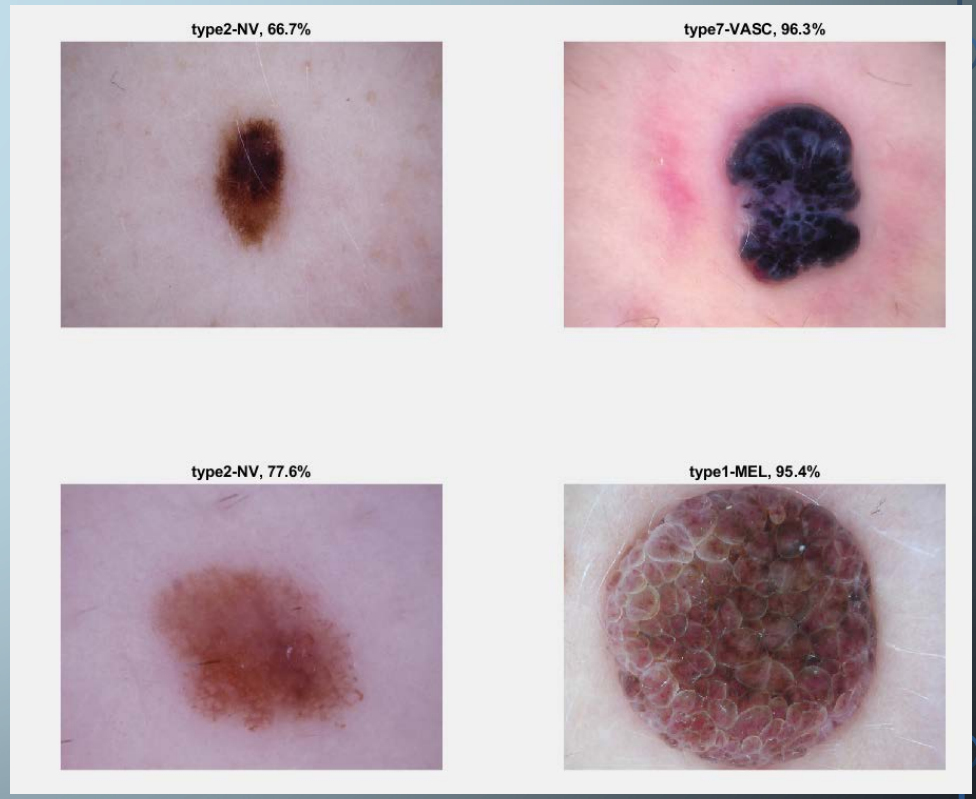
NEWTWORK RESULT

Preprocessing Step

- Separate tumor images into different folder based on its type

Processing Step

- Divide dataset into training and validation with ratio 8:2
- Adapt GoogleNet Arch to accept tumor image and give 7 different label as output
- Perform image augmentation
- Training with sgdm options, learning rate 3e-4, and epoch 12



CONCLUSION

Impact:

- Extra layer to prevent cancerous diseases from spreading by an early stage diagnose
- Faster lead-time to diagnosis
- Increase the accuracy of the skin-pathology

Disclaimer:

- This application does not aim to substitute the doctor's final assessment
- Additional layer as a reference for diagnosis

Next Steps:

- User friendly APP
- Store pictures (Cancer tracker)
- Improve performance of the APP (Network Selection, Preprocessing, Software Implementation)

THANK YOU