AIclub Lunch& Learn

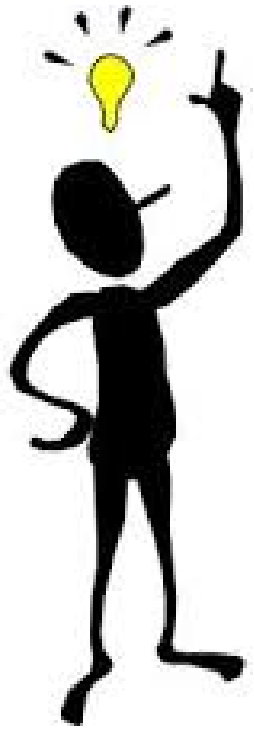
Feb. 2017

AIclub at Halyard

- A group of GEEKS!
- Weekly meetings
- Discuss new AI related topics
  - Articles
  - Talks
  - Projects

AIclub Outcome

- Inspirations for solving challenges
- New ideas
- A place to think out of the box



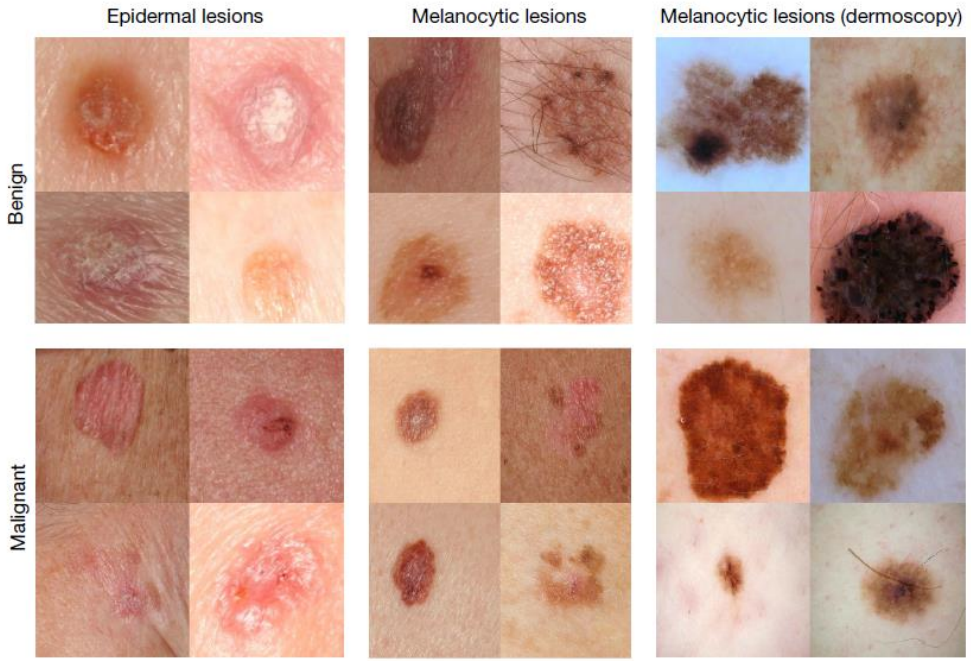
New Research Article on Nature

- **Dermatologist-level classification of skin cancer with deep neural networks**
  - Authors: A. Esteva, B. Kuprel, R. Novoa, J. Ko, S. Sweter, H. Blau, S. Thrun
  - EE&CS, Stanford University in collaboration with multiple healthcare institutes

- Video https://www.youtube.com/watch?v=IvmLEq9piJ4

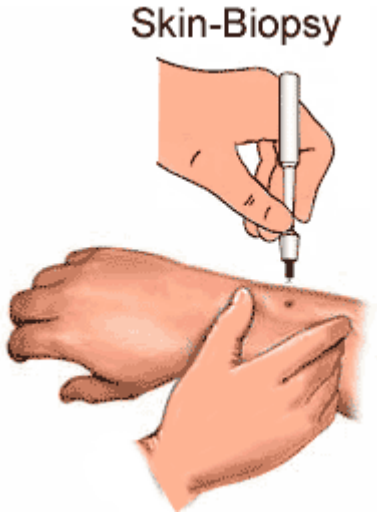
Motivation

- Around 5.4 million new skin cancer cases in the US every year
- Over 10,000 deaths annually in the US due to skin cancer
- Early detection is critical
  - Survival rate goes from 14% to 99% if detect early
- Computer-aided dermatology

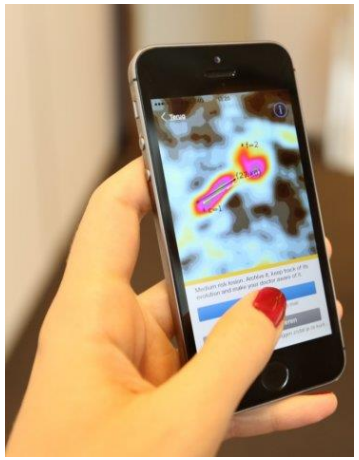


Introduction

- Imaging modalities
  - Dermoscopy images
  - Histological images
    - Invasive biopsy and microscopy images
  - Photographic images (ex. Smartphone images)

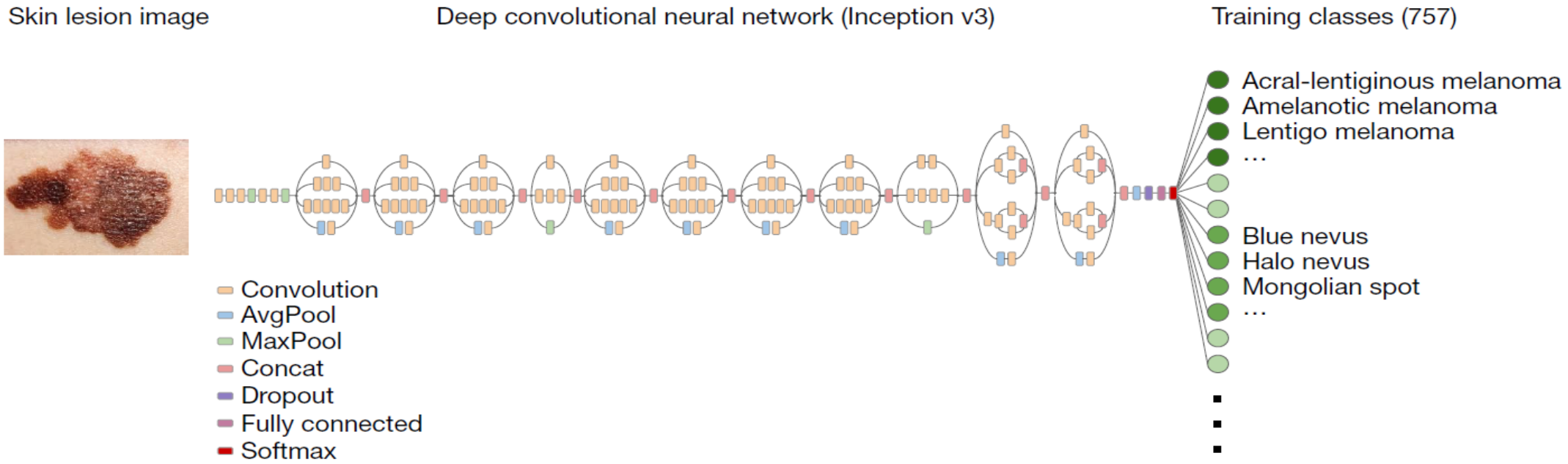


  - Previous work are not competitive
    - Insufficient data
    - Focus on standard imaging modalities



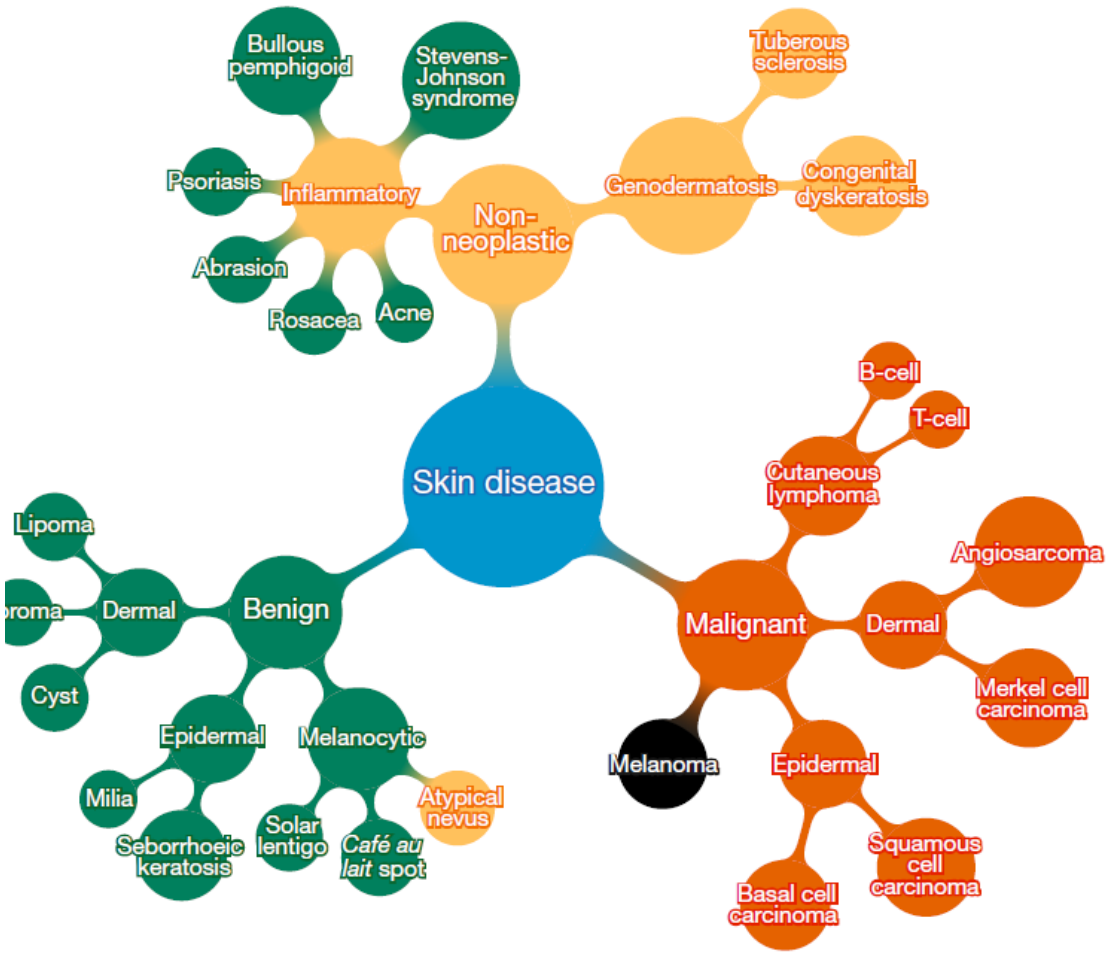
Method

- AI algorithm: GoogleNet InceptionV3 architecture
  - Pre-train on 1.28 million images



Dataset

- Around 130 k images for train
- Dermatologist labeled images
- Images come from 18 different clinician-curated repositories
- Organized in three groups with 2032 diseases



Results

- 180 images/dermatologist

Classifier	Three-way accuracy
Dermatologist 1	65.6%
Dermatologist 2	66.0%
CNN	69.4 ± 0.8%
CNN - PA	**72.1 ± 0.9%**

Disease classes: three-way classification

0. Benign single lesions
1. Malignant single lesions
2. Non-neoplastic lesions

Video

- Skin Cancer Image Classification
  - https://www.youtube.com/watch?v=toK1OSLep3s

Conclusion

- AI has significantly advanced
- AI for health care
- Identify a problem
- Collection of massive data
- Annotation with help of doctors
- Accessible diagnostic devices powered by AI