

MACHINE VISION FOR SCIENCE IMAGES



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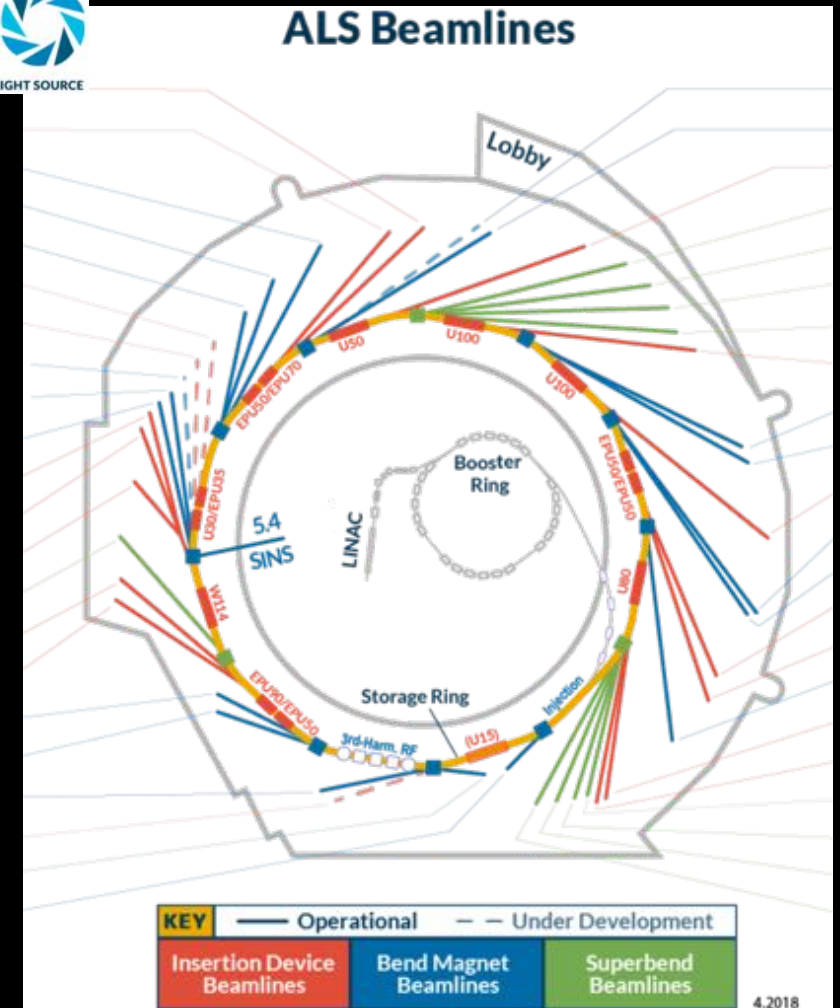
²Institute of Computational Health Sciences, UC San Francisco

BERKELEY LAB

2



Machine room



MACHINE LEARNING AND METROLOGY FOR MATERIALS

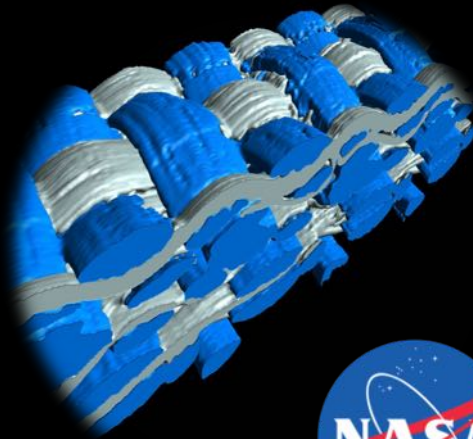
Analyze microstructure of materials to advance manufacturing

Ceramic matrix
composites



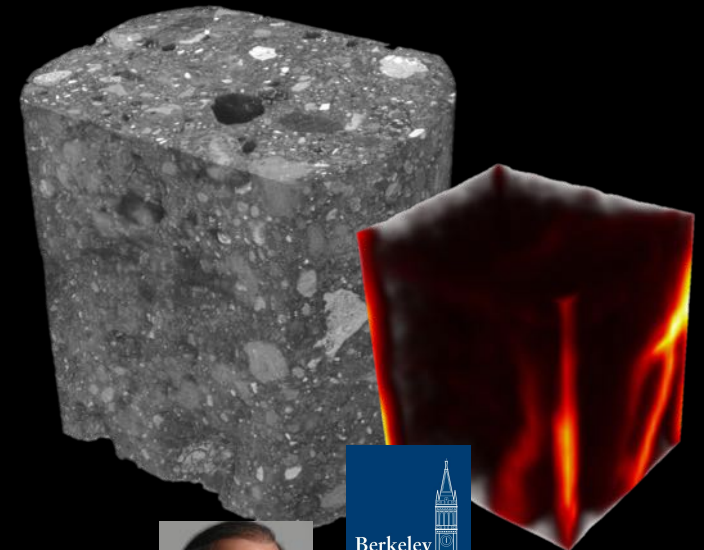
Robert Ritchie Yan Gao

Carbon textiles



Francesco Panerai

Roman concrete

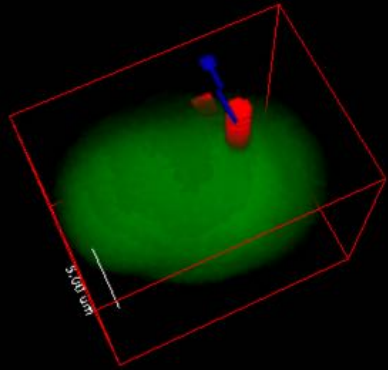


Paulo Monteiro

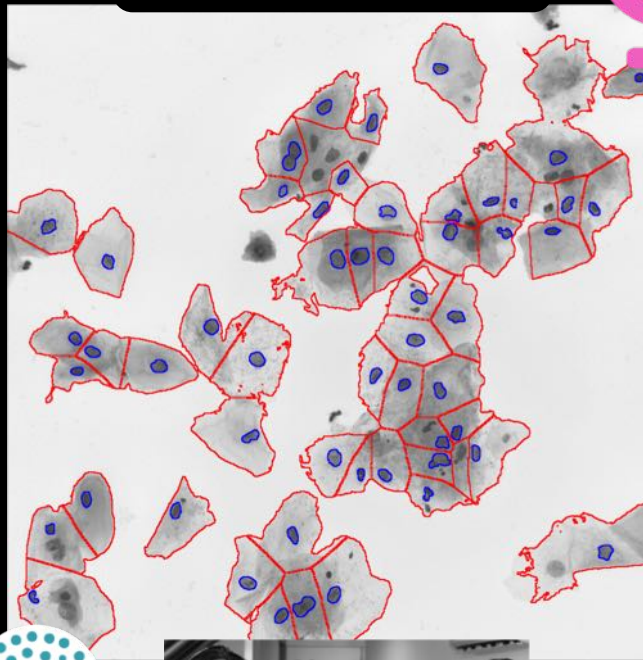
WOMEN & DATA SCIENCE

Image Analysis for Healthcare Democratization

Breast Cancer



Cervical Cancer



Alzheimer's



Mina Bissel

Kandice Tanner



Claudia Carneiro



Andrea Bianchi

Fatma Medeiros

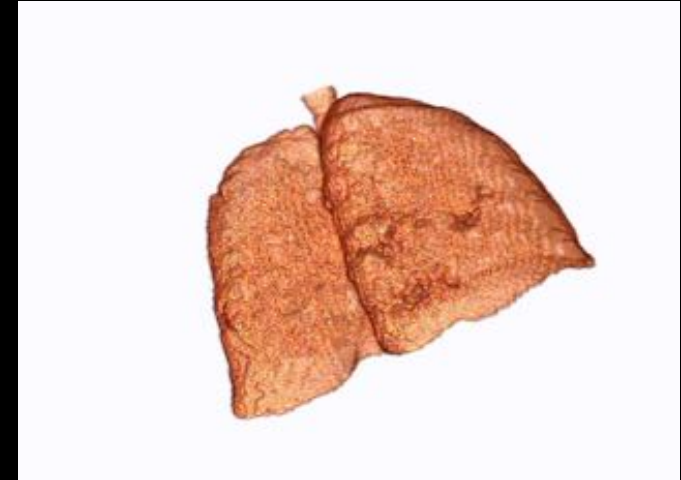


Lea Grinberg



Maryana Alegro

COVID-19 IN LUNGS SCANS



- **Chest X-ray**

- 2D
- Broadly available
- Projection of 3D
- Bones muddle the image

- **Computed tomography**

- 3D
 - Restricted availability
 - Details at sub-mm scale
- Bones are “erased” digitally



CULTIVATING NEXT GENERATION OF SCIENTISTS

Research and development through collaboration with and support to the next generation of scientists and engineers around the world

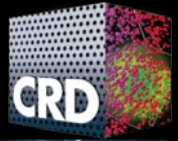


America, Brazil, Cameroon, Canada, China, India, Kenya, Netherlands, Nigeria, South Africa, Thailand, Tunisia, Zimbabwe

ACKNOWLEDGEMENTS

THANK YOU

More info:
<https://bit.ly/machinevisionlbi>



WHERE ALL STARTED



WEEKEND FUN TIME



BLACK GIRLS CODE

BIDS has supported the BGC **instructors training** by allowing the use of its space for two years in preparation to Robot Expo. Also, BIDS fellows and staff volunteered in benefit of hundreds of girls in the Bay Area.



Train the Trainers



Bitcoin



3D printing



Robot Expo

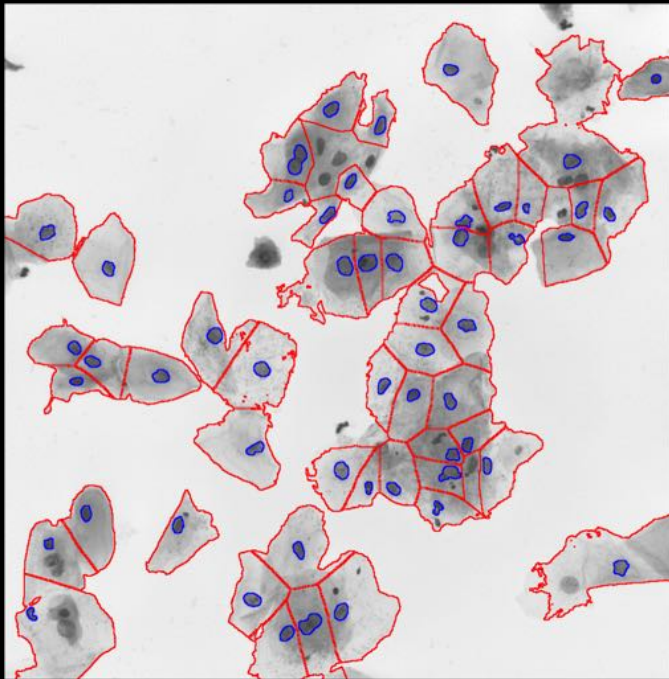
IT TAKES A VILLAGE



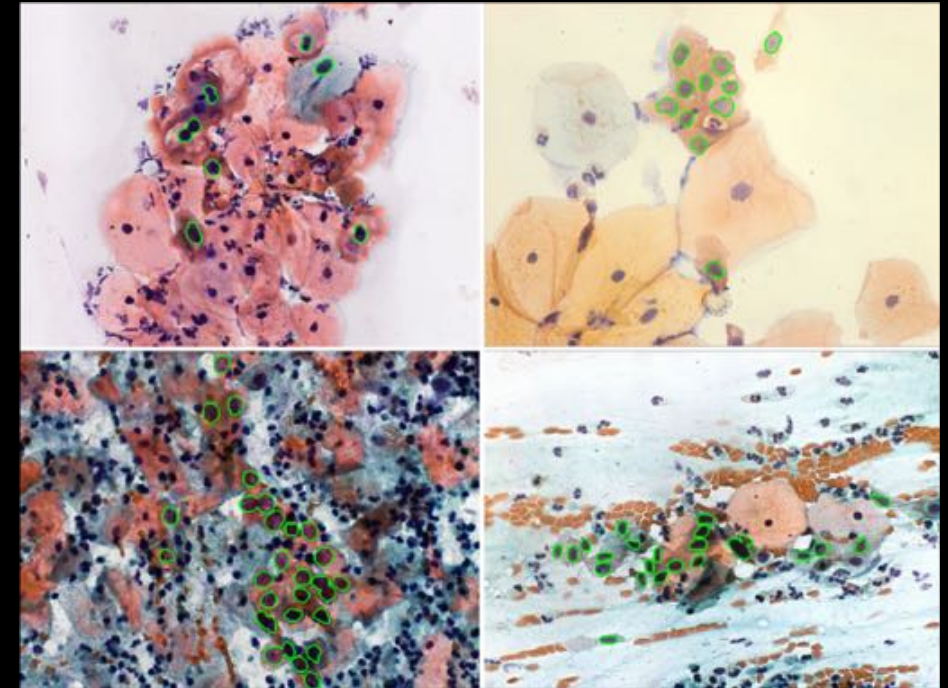
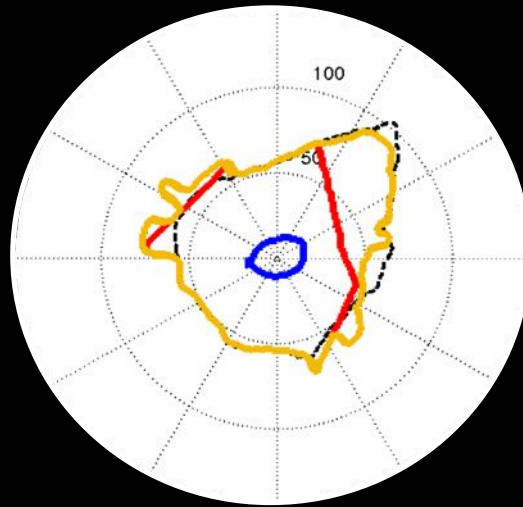
FROM CELL SIMULATIONS TO REAL PAP SMEAR DATA

2013

2020



IEEE ISBI 2014



Deep learning for detection of abnormal cells



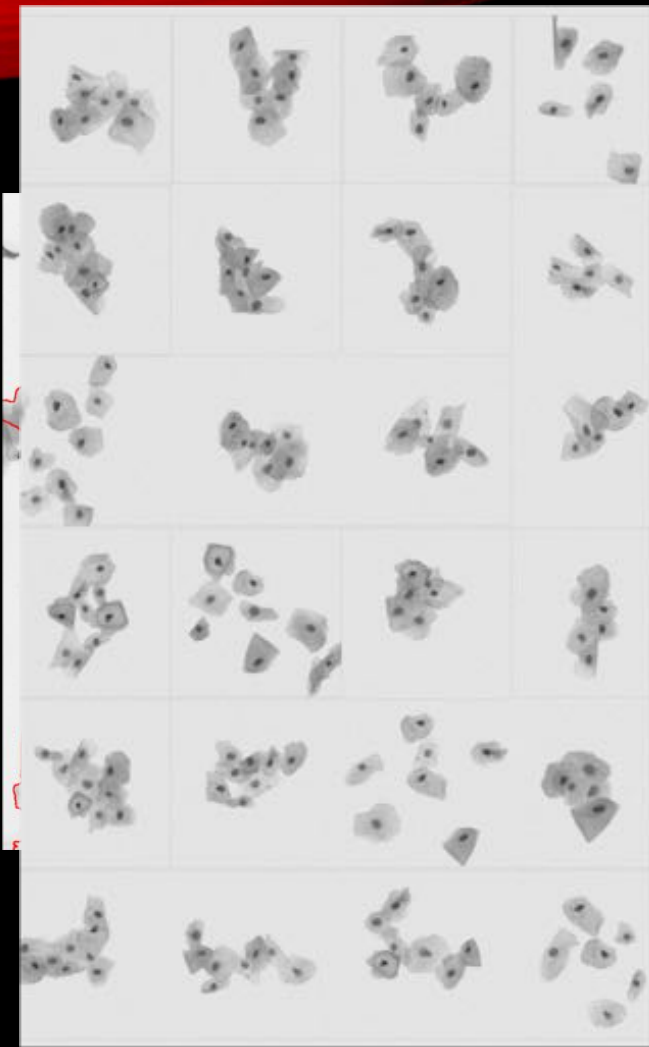
Data Science Fellowship



Machine Learning Research Award



IEEE INT. SYMPOSIUM ON BIOMEDICAL IMAGING 2014
OVERLAPPING CERVICAL CYTOLOGY IMAGE SEGMENTATION CHALLENGE



- Xmas 2013 and 1 month to deliver results;
- Input data:
 - 512x512 pixels, 2+ cells/img with different degrees of overlap, contrast, and texture;
- 961 images:
 - GT: train 45, test: 90 realist
 - Unknowns: 16 real + 810 realistic
- Our algorithm SPVD:
 - computer vision + machine learning.