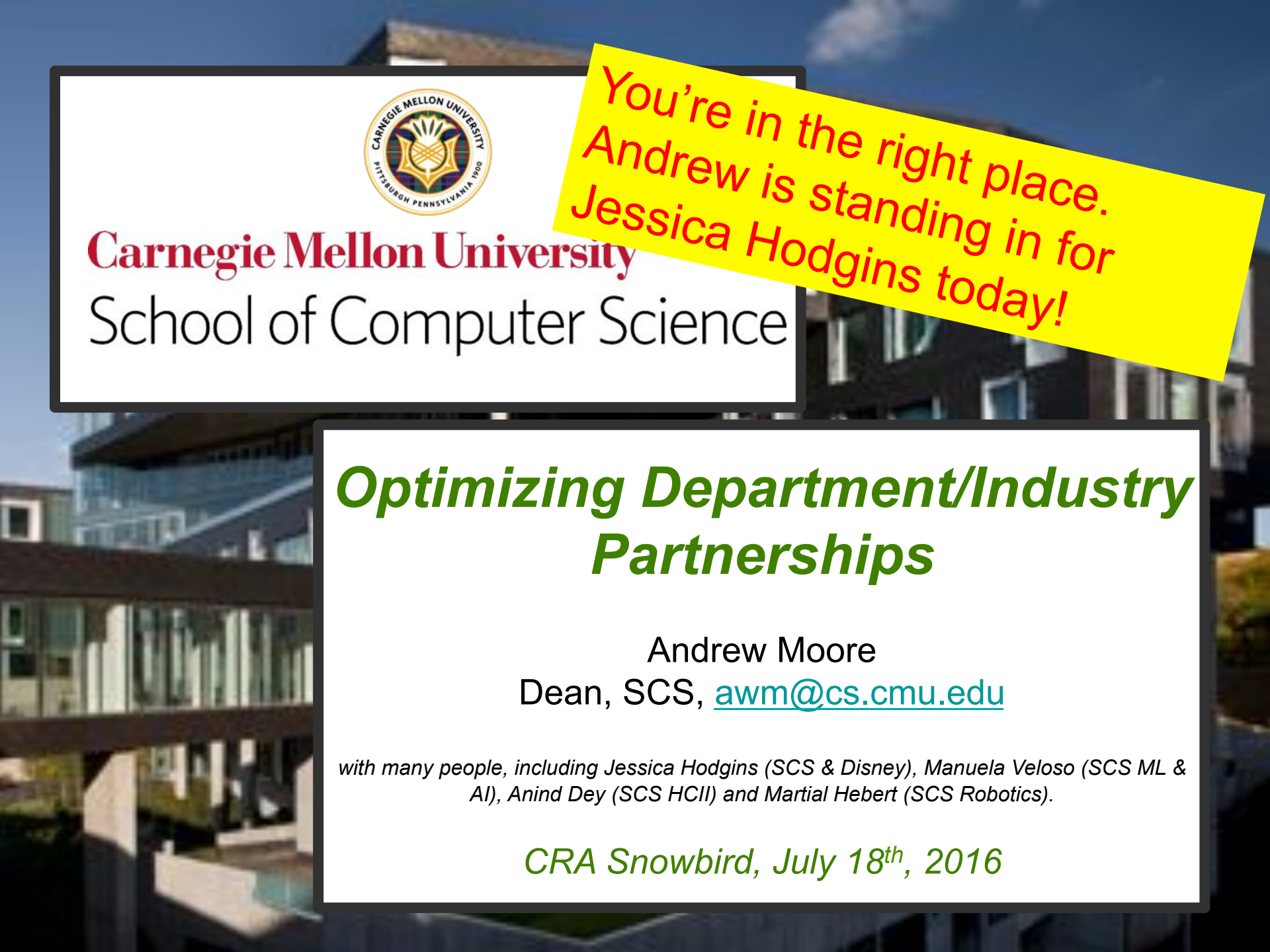

Carnegie Mellon University
School of Computer Science

You're in the right place.
Andrew is standing in for
Jessica Hodgins today!

Optimizing Department/Industry Partnerships

Andrew Moore
Dean, SCS, awm@cs.cmu.edu

with many people, including Jessica Hodgins (SCS & Disney), Manuela Veloso (SCS ML & AI), Anind Dey (SCS HCII) and Martial Hebert (SCS Robotics).

CRA Snowbird, July 18th, 2016

This Talk

- What has SCS learned from local industry ties?
- What works?
  - For the companies
  - For the students and the school
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- Tips and tricks
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The General Case

General Things that work for the companies

- Access to students

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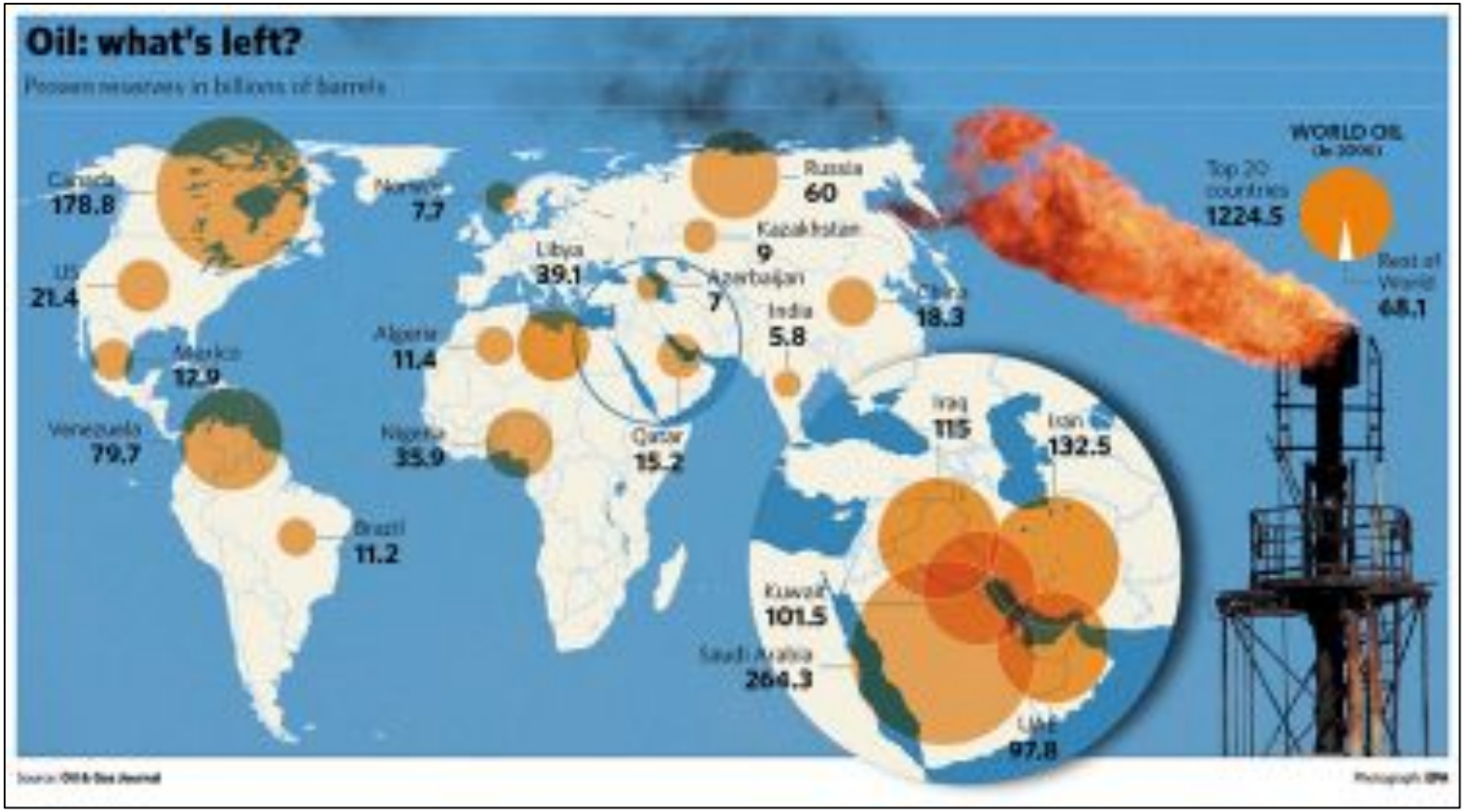
- Access to students
- Advantage in the global talent wars



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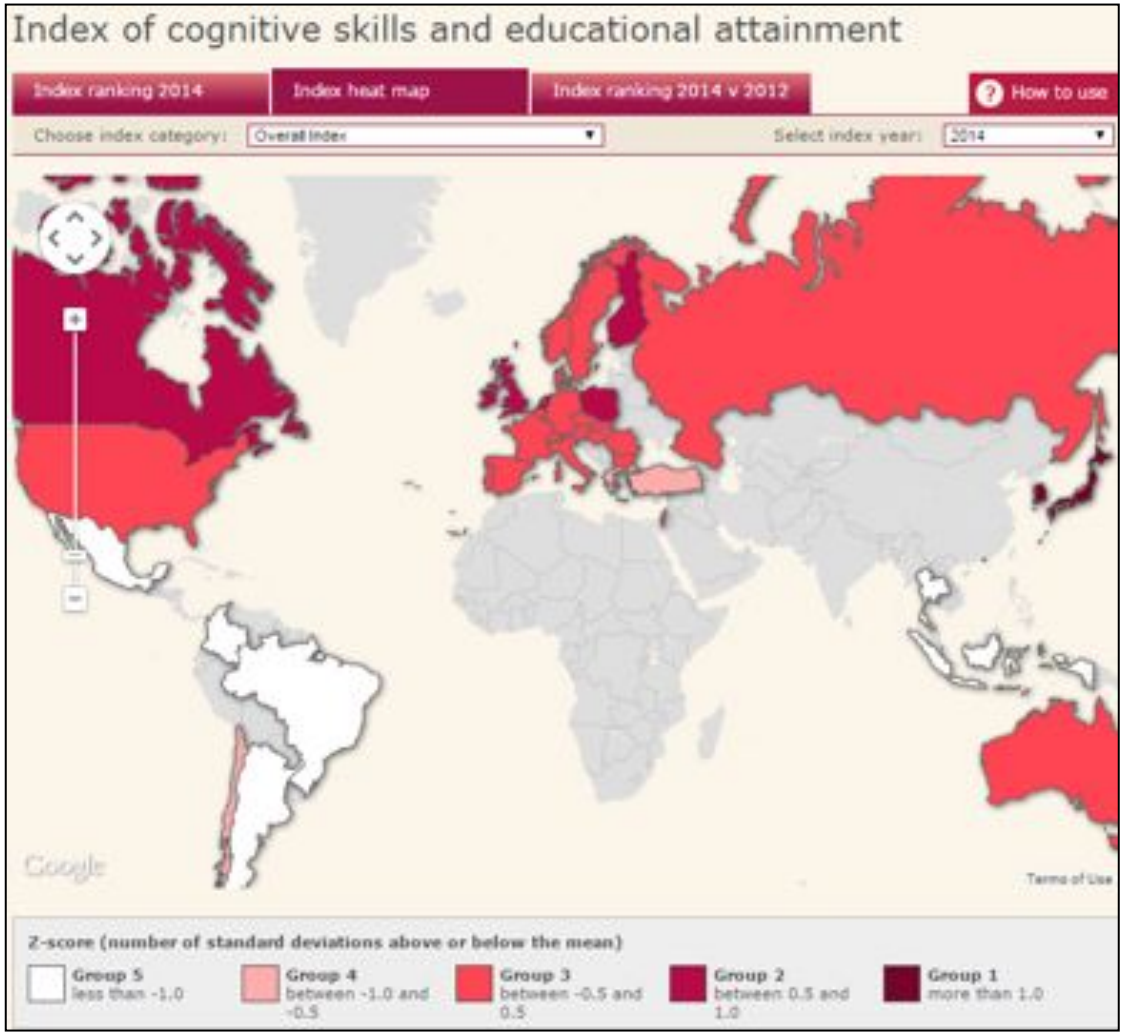

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General Things that work for the companies

- Access to students
- Advantage in the global talent wars
- Haves & Have-nots

Have (n): A global software-focussed company, or a small company with high potential upside, which has its own computer scientist talent.

Have Not (n): Any company which does not have a major internal computer scientist cohort.

General Things that work for the companies

- Access to students
- Advantage in the global talent wars
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  - *Haves:*
    - *it's the donut*

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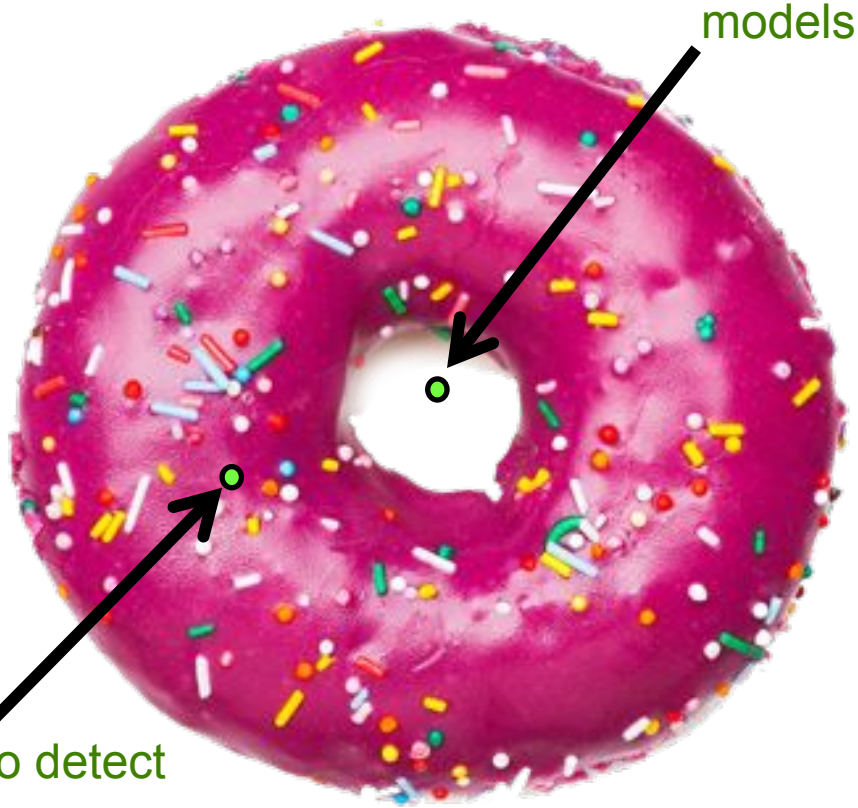

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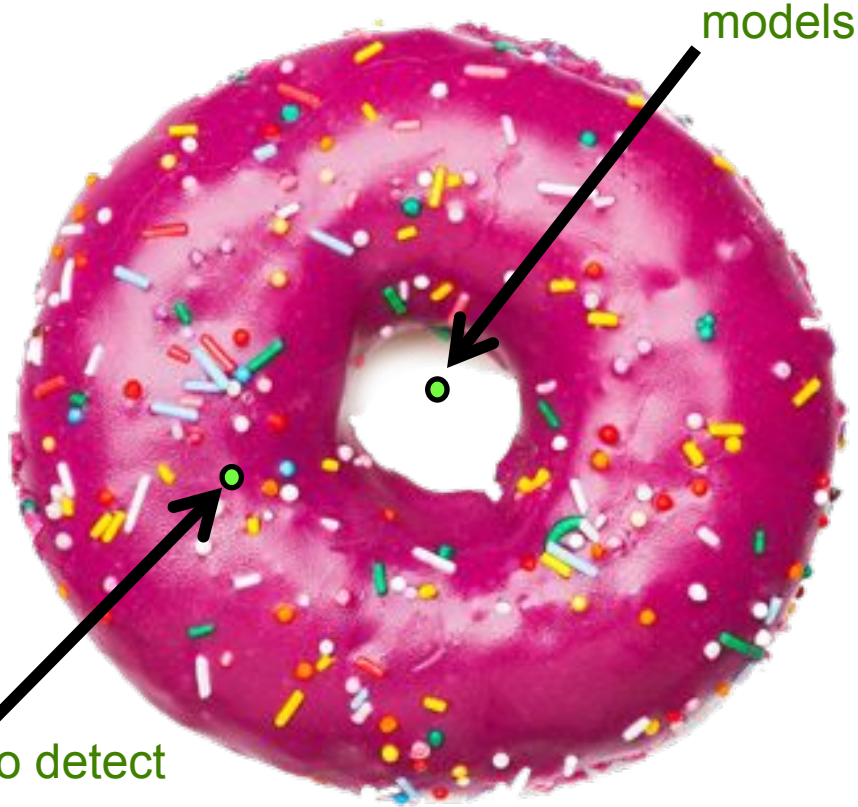

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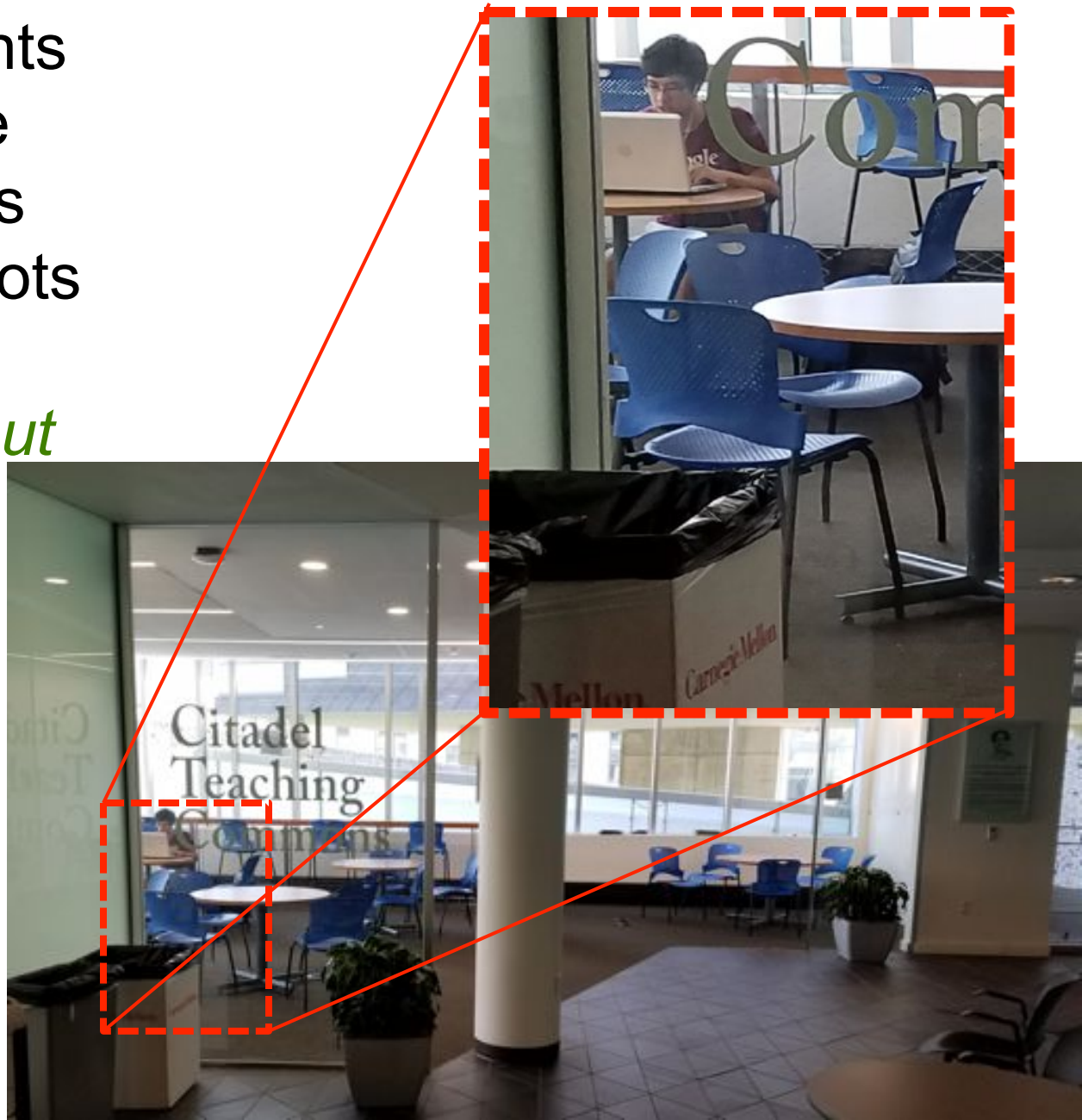

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    - *it's the culture changers*

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Specific Stories

Disney	Better products, new thinking
Google	Industry breakthroughs, talent acquisition, outreach to new groups
IBM	New technology, quick expansion when needed
Caterpillar	New technology and business model
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Disney Research

THE Science BEHIND THE Magic

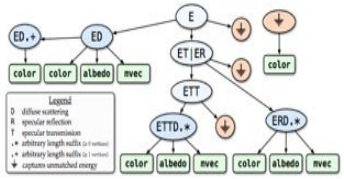
Denoising Case Study: Paper to Press

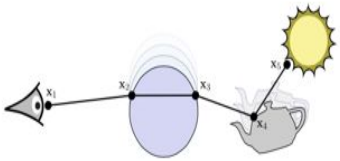
Fabrice Rousselle, David Adler (WDAS), Henning Zimmer, Oliver Wang, Peter Kaufmann, Wojciech Jarosz, Alexander Sorkine-Hornung

Originating Research

Path-Space Decomposition for Improved Spatio-Temporal Upsampling and Denoising of Rendered Animations

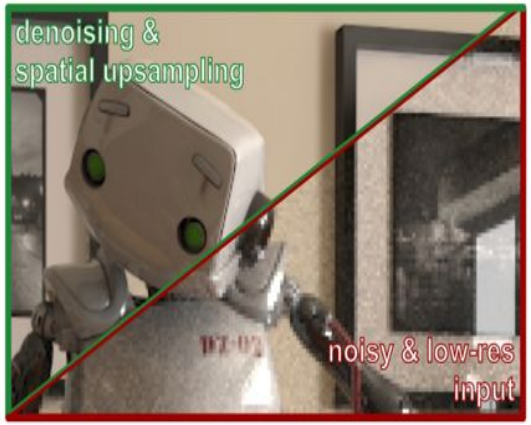
$$D(\mathbf{v}_t) = \sum_{\mathbf{f}\in\mathbf{F}} \frac{1}{n_\mathbf{f}} \Psi_p\left(\|\mathbf{f}_{t+1}(\mathbf{p}+\mathbf{v}_t(\mathbf{p})) - \mathbf{f}_t(\mathbf{p})\|^2\right)$$





Paper Published

Path-Space Motion Estimation and Decomposition for Robust Animation Filtering - Eurographics 2015



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Disney Confidential - Do Not

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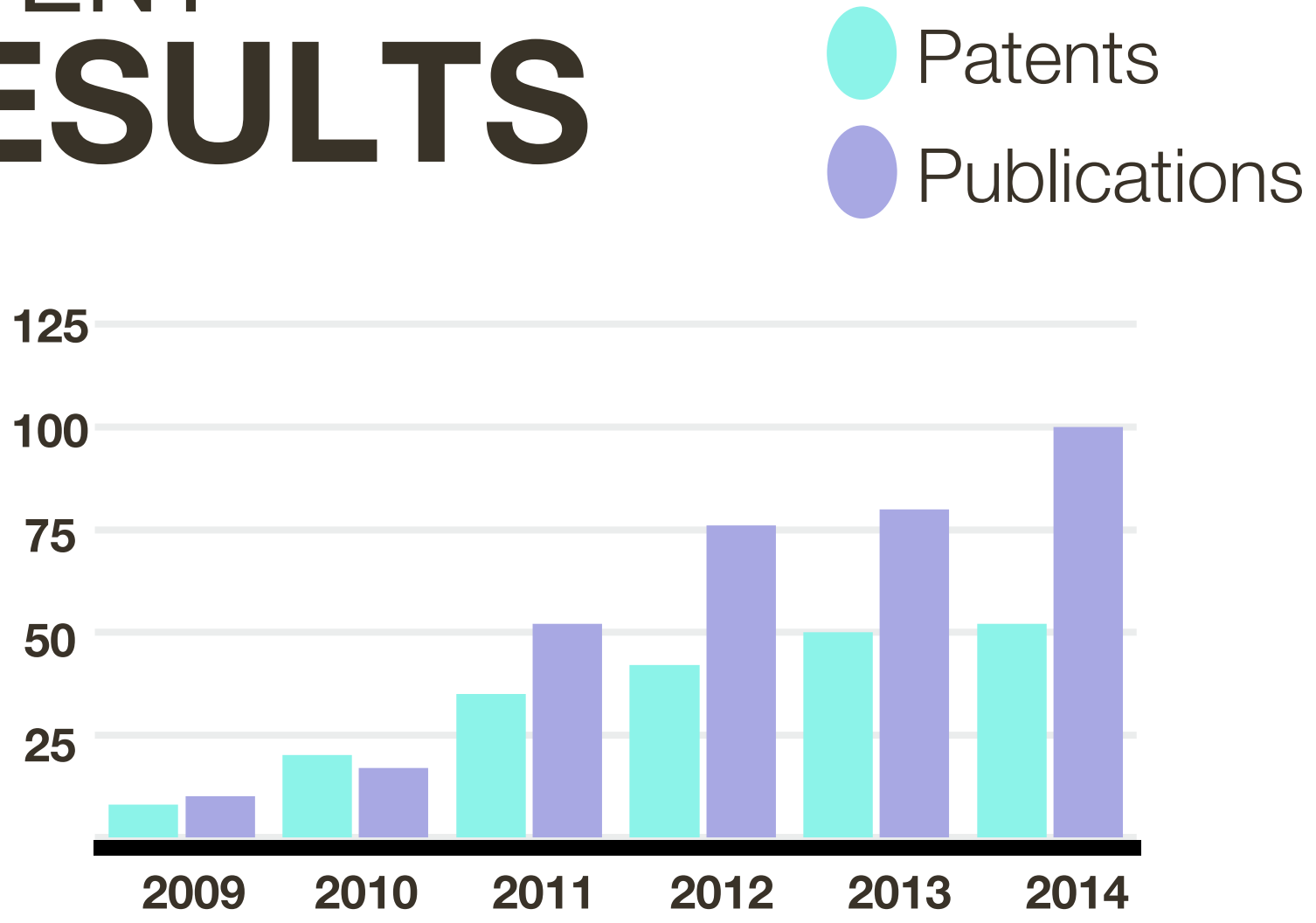
Contribution to Walt Disney Animation Studios Hyperion Team

Collaboration credited in **Big Hero 6**

Disney Confidential - Do Not

PATENT RESULTS



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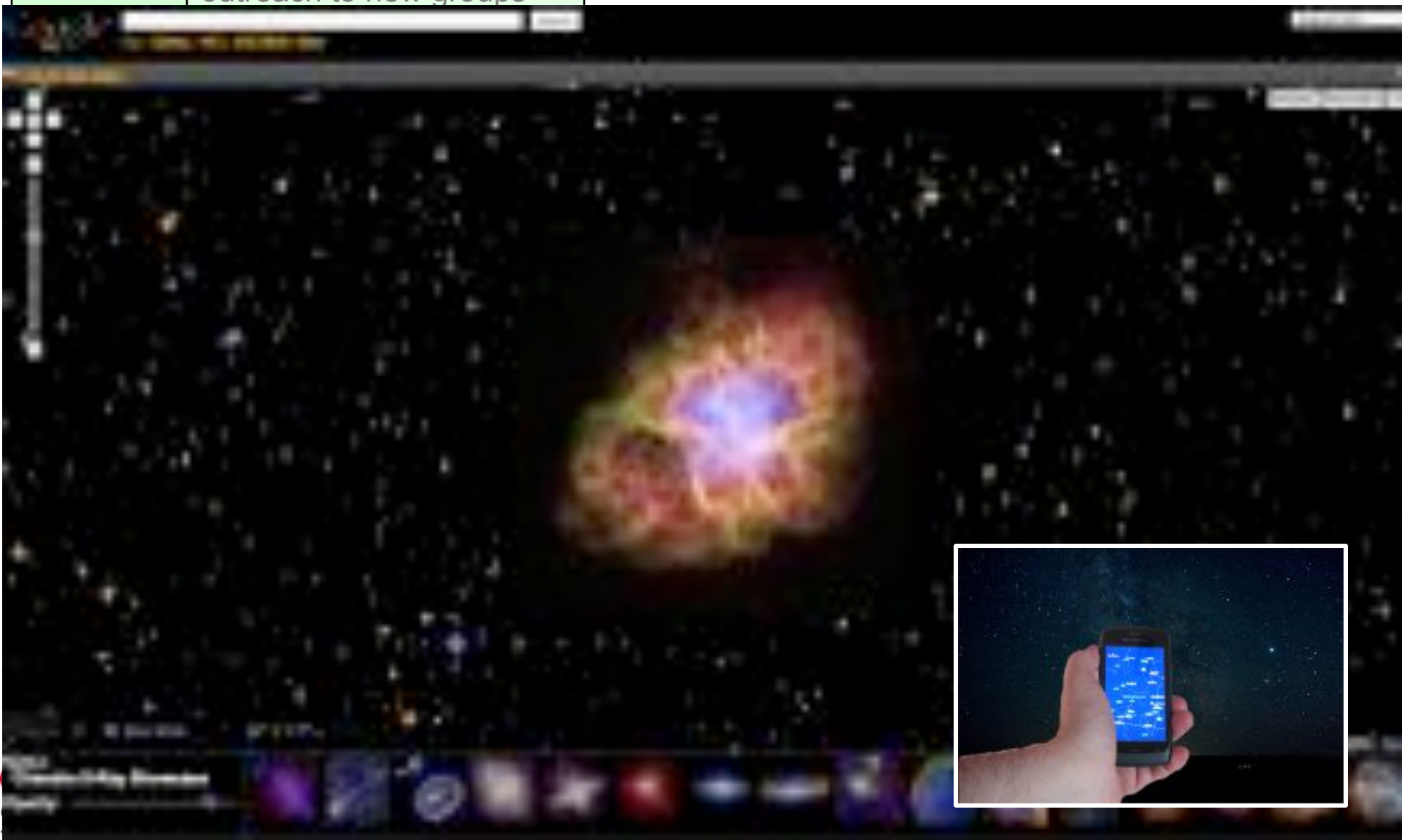

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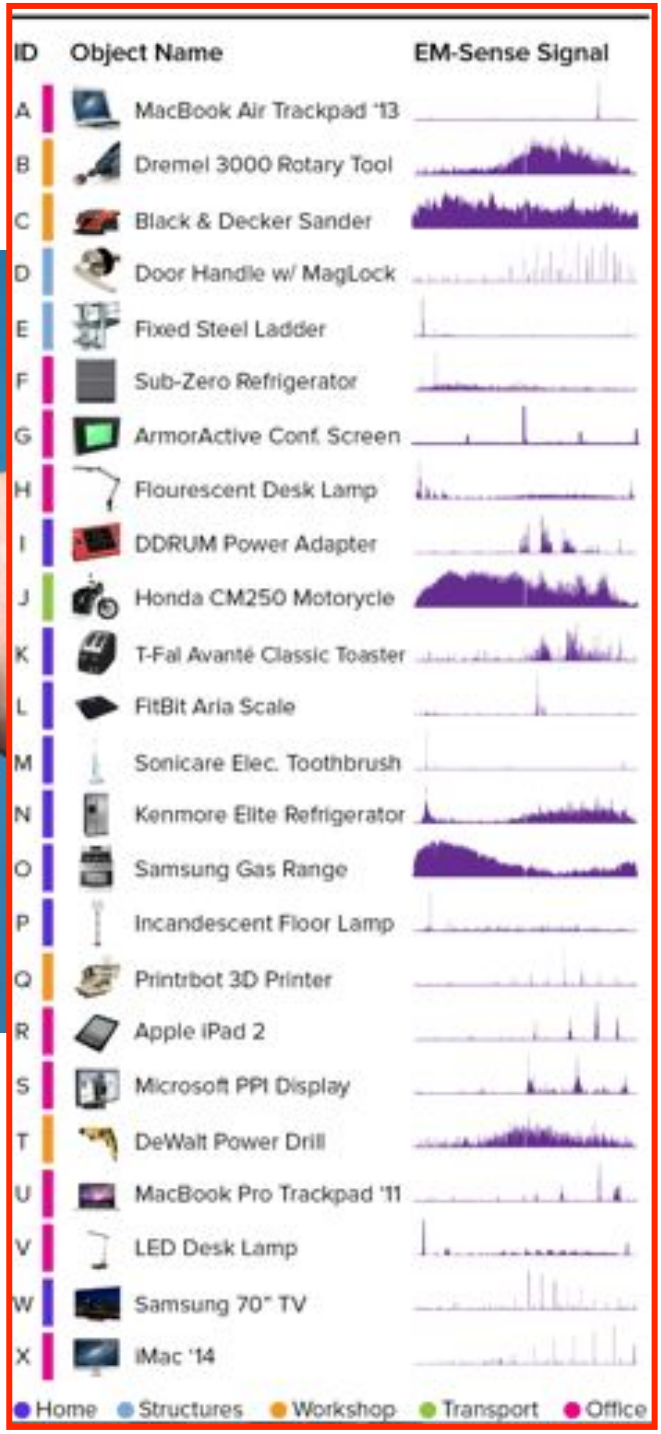

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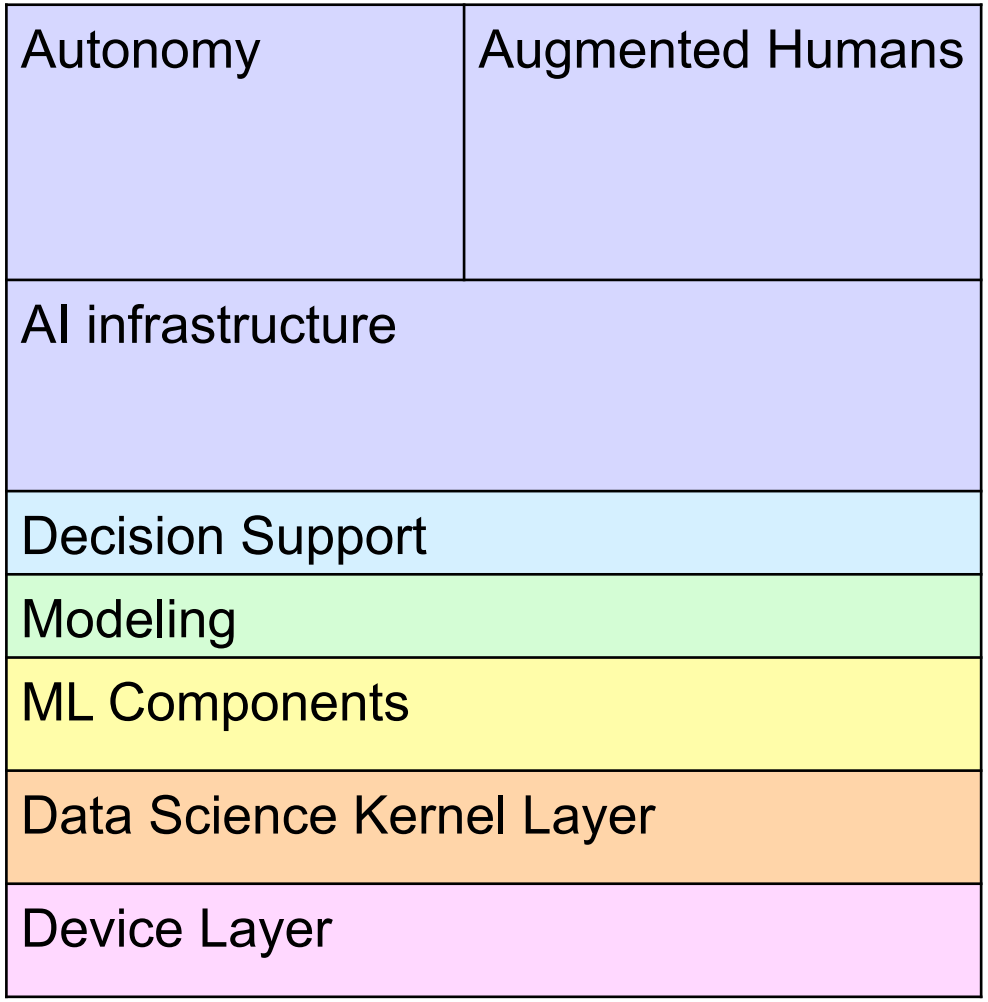
AI technology stack



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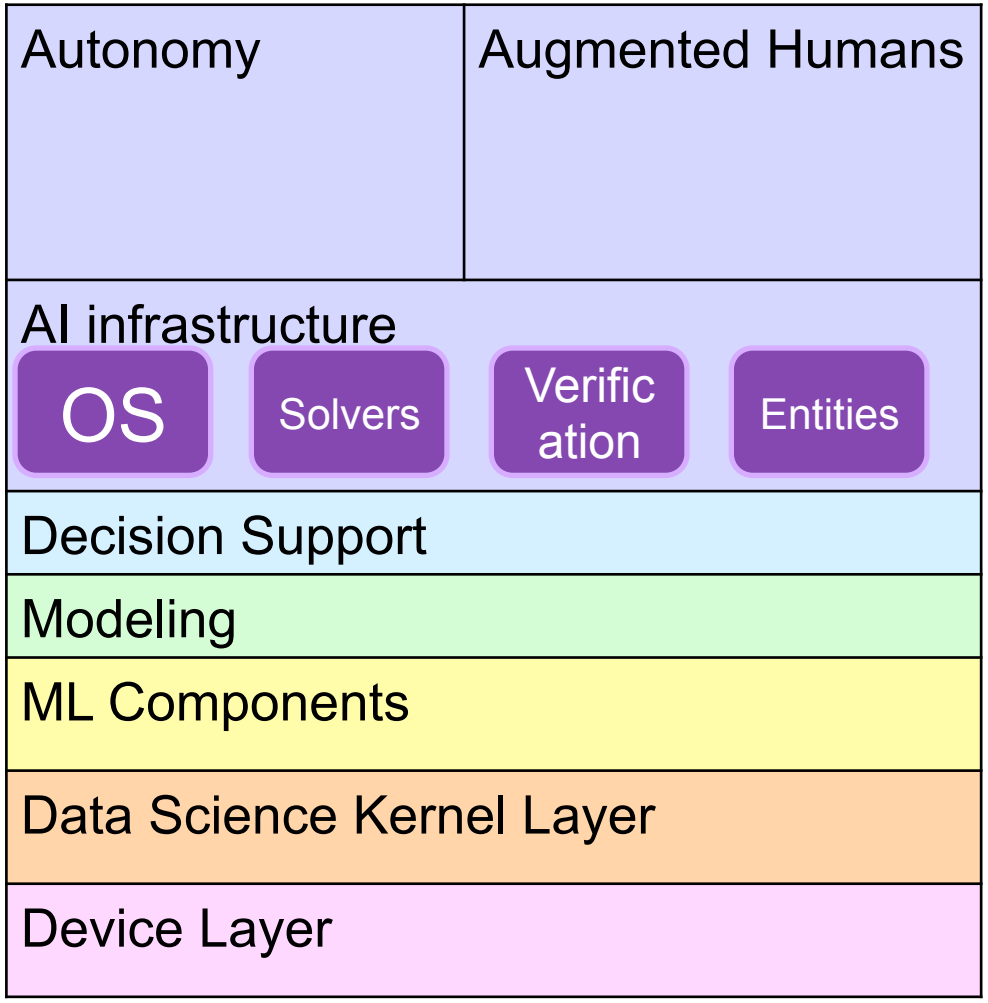
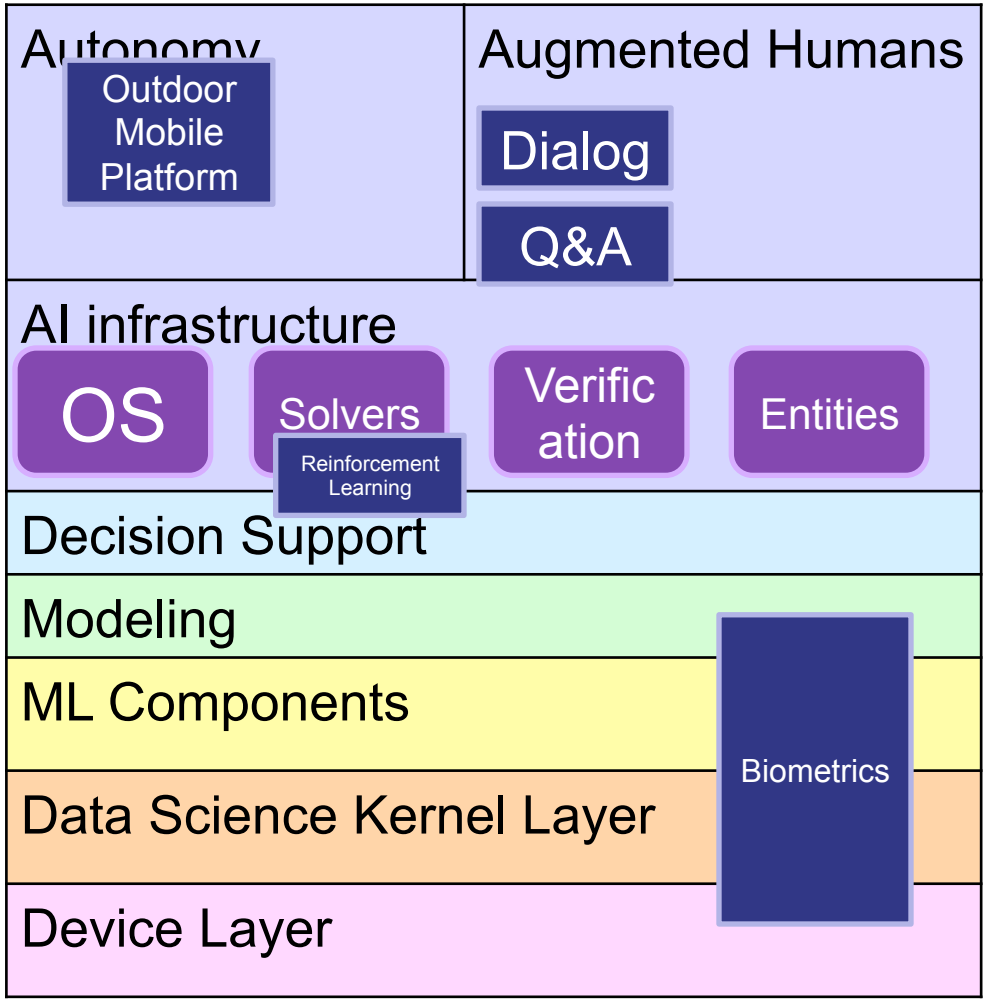


Industry focus areas

AI infrastructure component

Industry Hotspot 2016



Industry DANGER!!!

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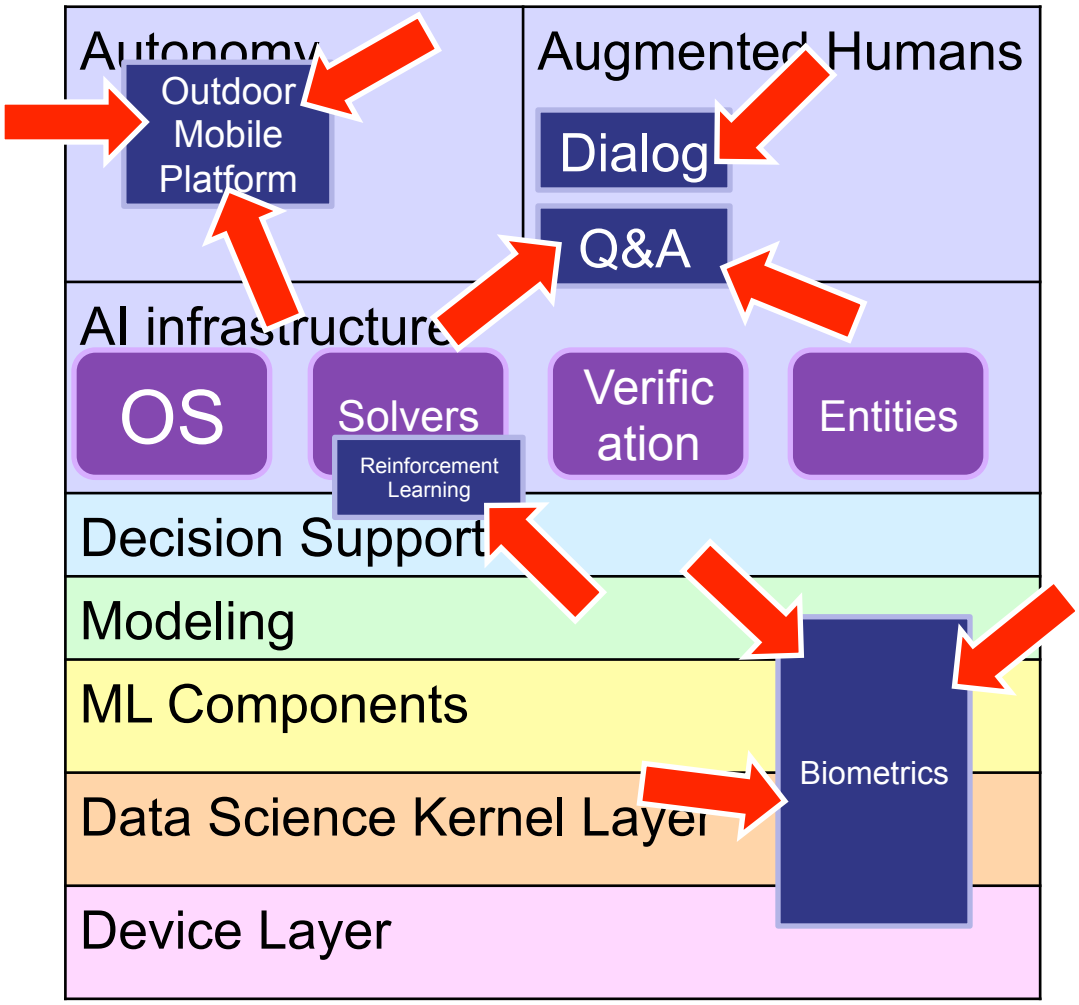

CMU focus areas

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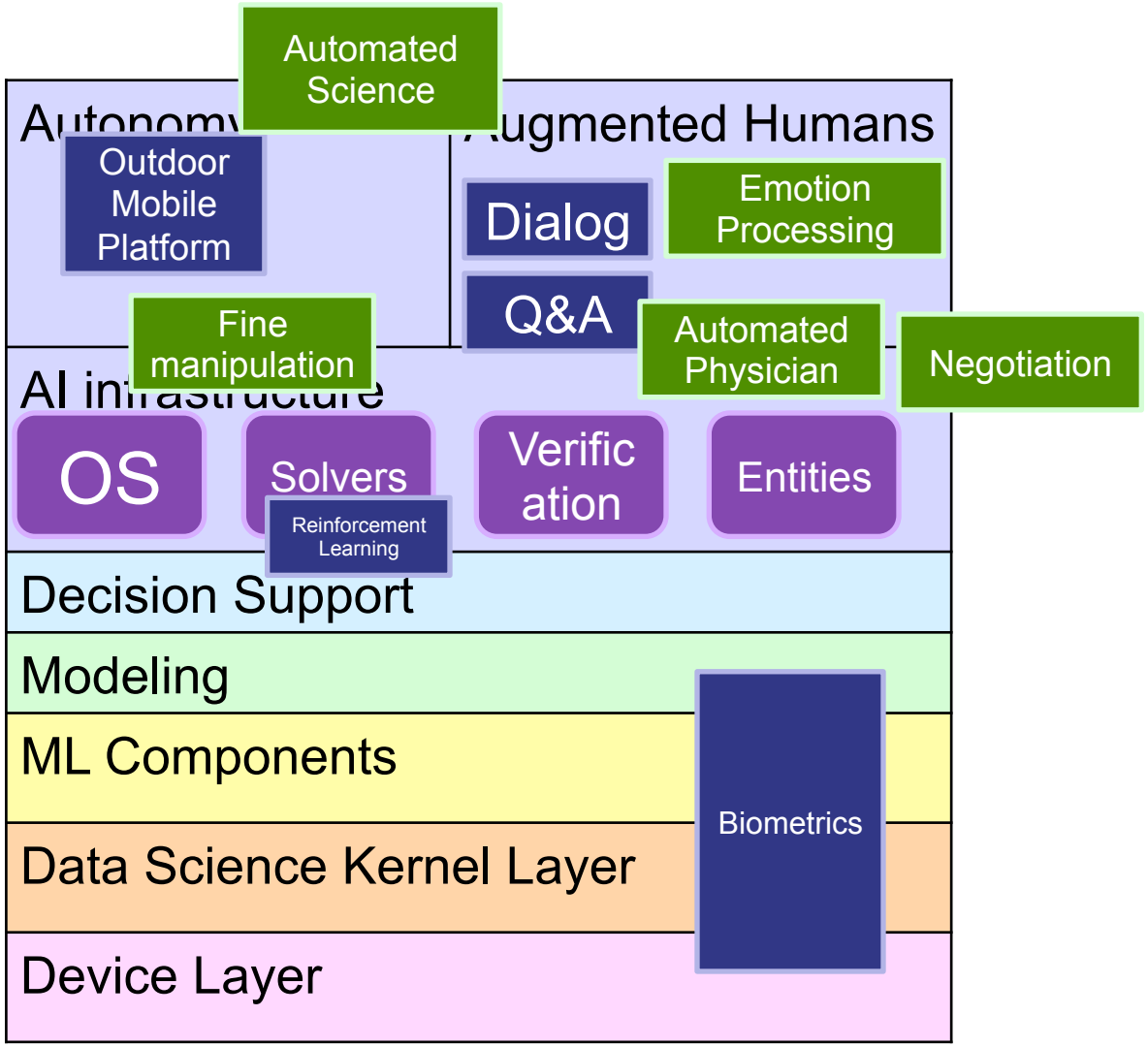
Industry Hotspot 2016

CMU/SCS investment



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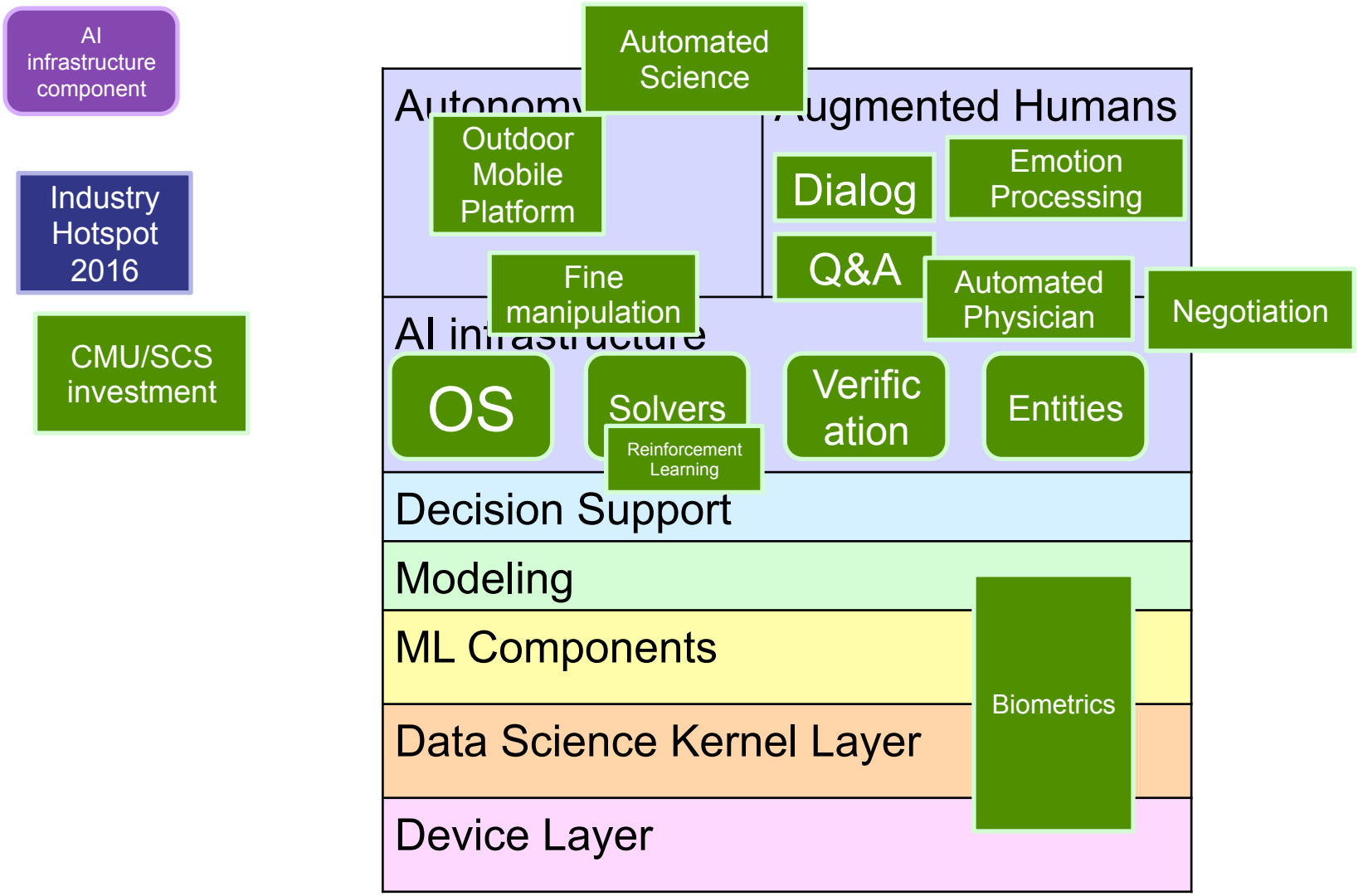
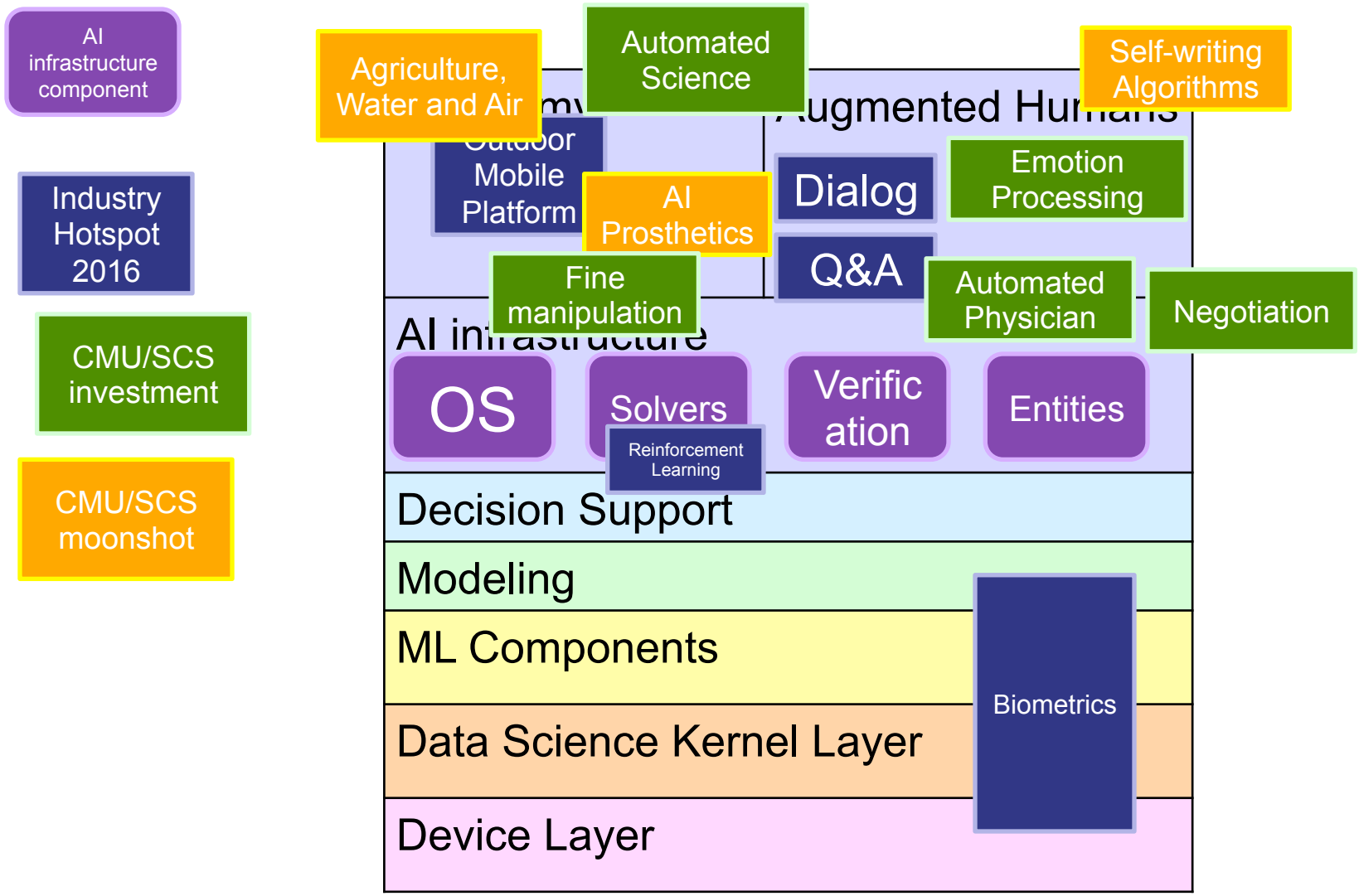


Moonshots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Self-writing Algorithms
Outdoor Mobile Platform
AI Prosthetics
Dialog
Emotion Processing
Q&A
Fine manipulation
Automated Physician
Negotiation
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Where we misstepped

- Rookie Mistakes

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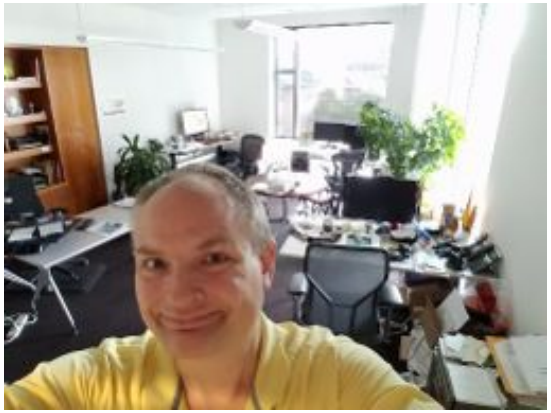

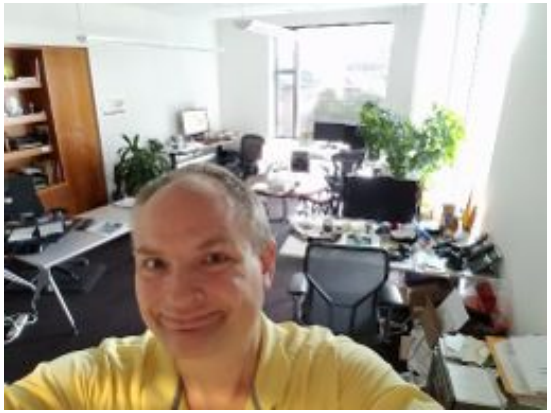

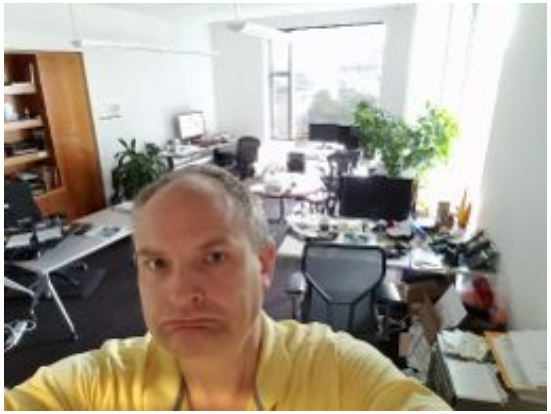

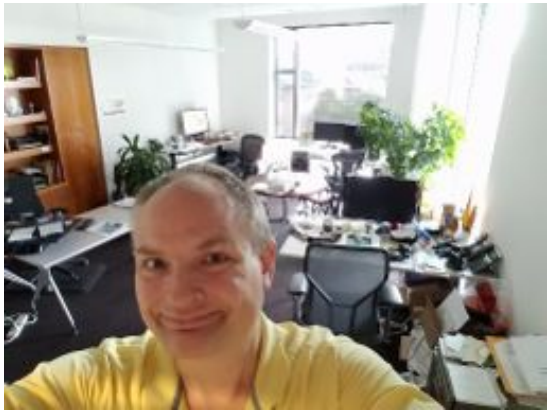

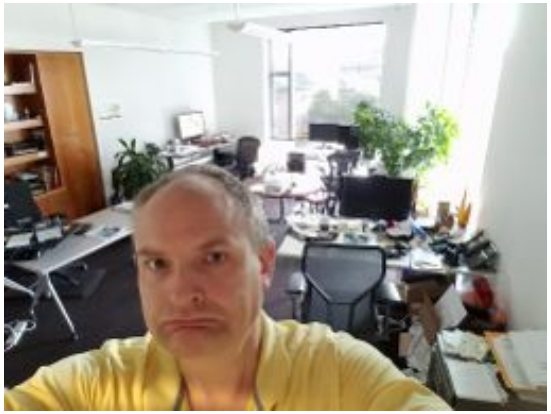

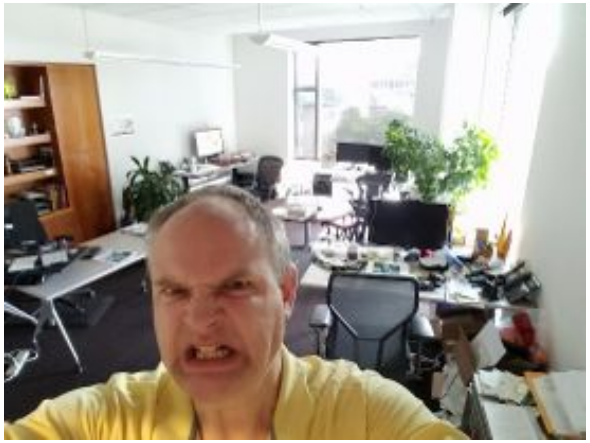

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- Issues which will always be hard
  - Joint IP issues
  - Grad Student + Faculty + Company triangle
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- Issues which will always be hard
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  - Grad Student + Faculty + Company triangle
  - Distracted Faculty

- Requires careful attention but a good problem to have:
  - So-called faculty “poaching” by industry

This Talk

- What has SCS learned from local industry ties?
- What works?
  - For the companies
  - For the students and the school
- Where we misstepped
- **Tips and tricks**
  - My personal suggestions
  - Consensus suggestions from this group

Tips and Tricks for a loving University/ Company relationship

Dos	**Don'ts**
Back Channel friendships	Don't do it solely for funding
Central part of curriculum discussion	Deal with IP issues head-on, and ramp up your legal and contracts teams
Student exposure	Remember the donut: don't aim for the center for the "Haves"
Find out the mission of the local lab, and help nurture it.	Don't be a work-for-hire shop for the "have nots".

My personal suggestions

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My personal suggestions

I would be grateful for changes and additions to this tip/trick set.