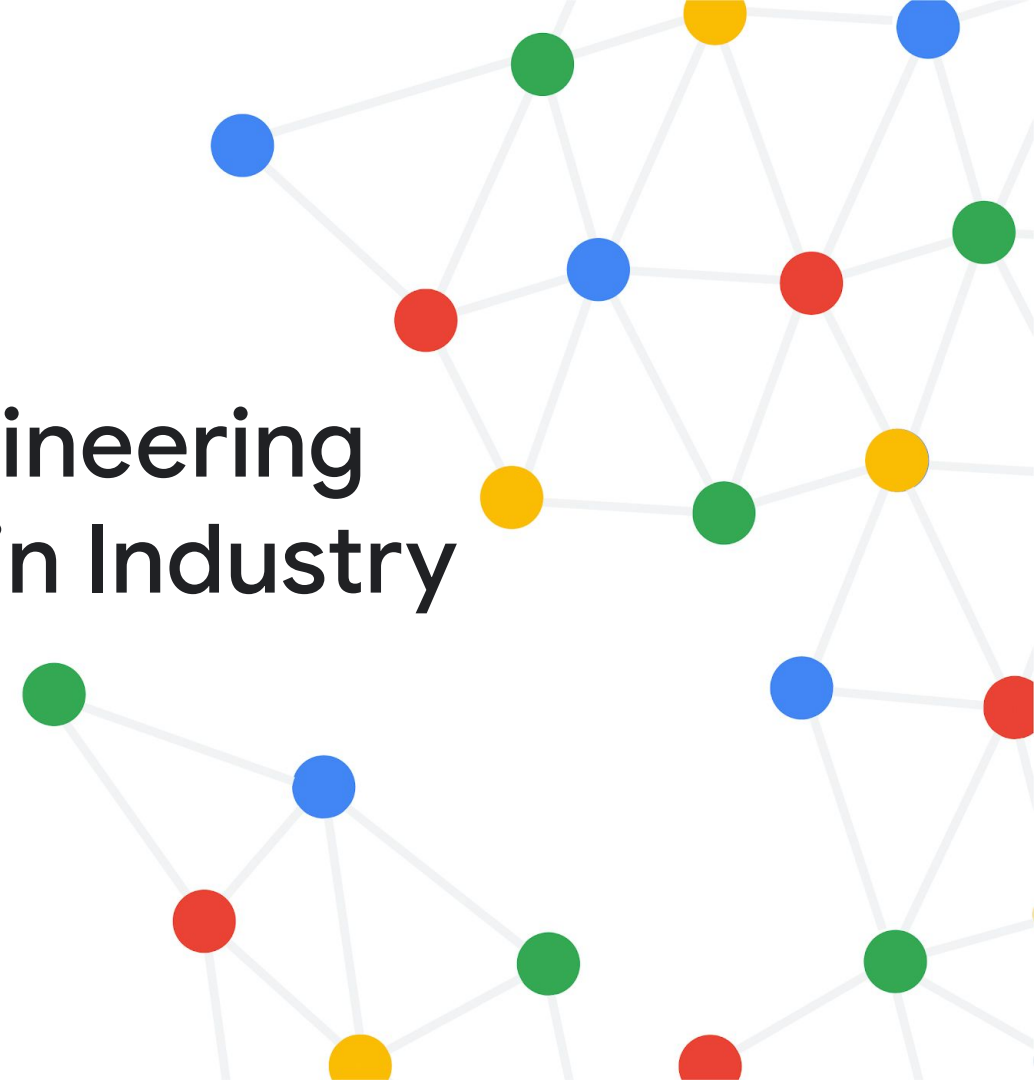
Research and Engineering Careers for PhDs in Industry

Vincent Vanhoucke, Principal Scientist

Google Research



Who am I?

Vincent Vanhoucke

Research: Robotics, Computer Vision, Speech Recognition

Director, Robotics at Google

I write about ML and Research at: http://medium.com/@vanhoucke

How to Predict the Future: With Science!

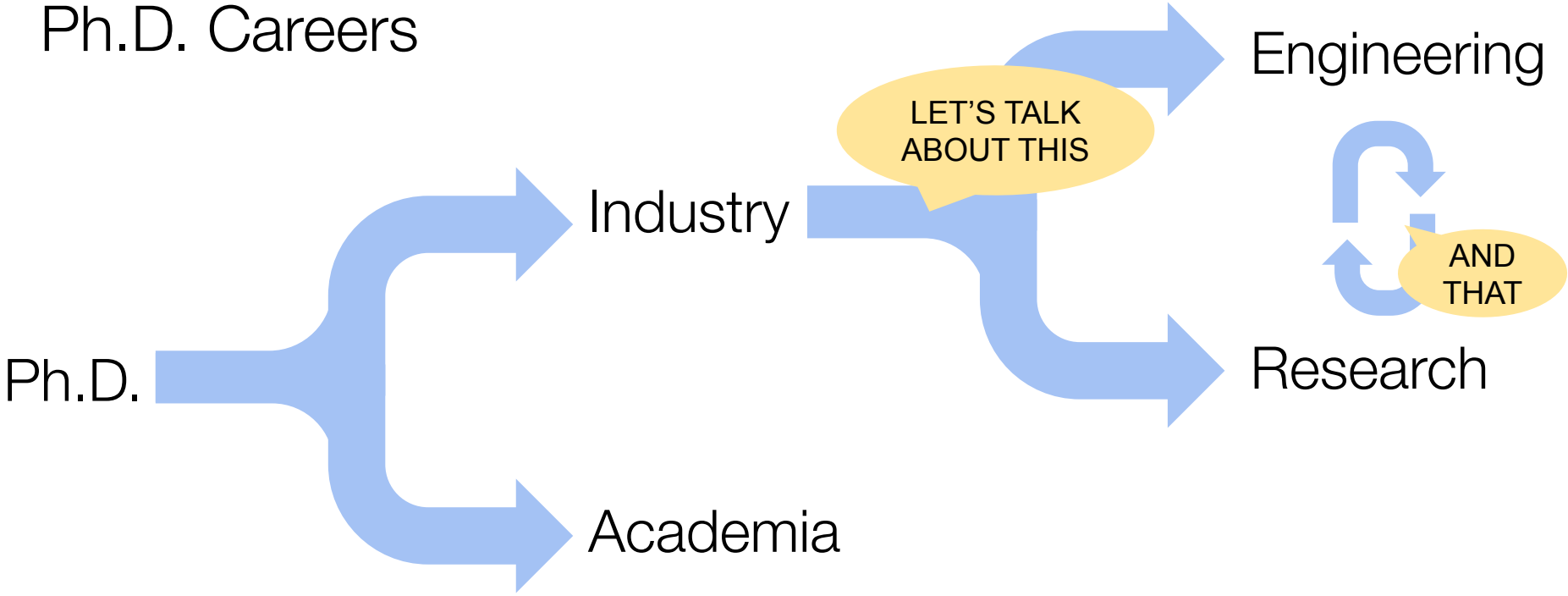
‘What will I be doing in 10 years?’

A) Project yourself 10 years in the future. Imagine what you’re doing. Tadaaa…

B) Consider people who were *you* 10 years ago. Look at what they’re doing today.

There is overwhelming evidence that B) is a much more accurate strategy.

Ph.D. Careers


Ph.D.
Industry
Academia
LET'S TALK ABOUT THIS
Engineering
Research
AND THAT

I am getting a Ph.D. because I want to do Research

Future-you may disagree. A large fraction of Ph.D.s don't pursue research careers!

Common reasons?

- Your career equation will evolve and become more constrained: it will also be about where you live, what your partner does, where the opportunities are.
- Working on *things that don't work* can get … old.
- The drive to build!
- Your beloved field of research will evolve:
  - It can stagnate, sometimes for a decade,
  - It can die!

The Revolving Door of Research and Engineering

Industrial careers often meander between research and engineering.

Typical patterns:

- Jump to new field as an engineer, develop expertise that leads you to new research.
- Develop new research, follow it through to implementation and deployment.

At Google, it can take many forms: new technology development, 20%, transfers.

The Value of Living ‘on the Edge’

The most valued individual in an industrial research lab often is that one person who can talk to both engineers and researchers in their respective language.

- Turn research bottlenecks into engineering requirements.
- Map engineering constraints into research problems.
- Quickly turn promising research into a convincing proof of concept.
- Leverage infrastructure to scale research effectively.

Advice #1: Value the Process of Earning your Ph.D. over the Outcome

- In my experience as a manager, there is a significant difference between those who earned a Ph.D., and those who didn't.
- Ph.D.s tend to approach problems as something to 'solve', not to 'fix'.
- It has nothing to do with 'expertise'.
- It has to do with method: how to approach roadblocks, how to reason about uncertainty, how to de-risk problems.

Don't sell yourself short by thinking that your value is in what you've become an expert at.

Advice #2: Strive to Become a Great Engineer

- Being a good researcher AND a good engineer opens doors that will never close on you, and multiply the ways in which you can make an impact.
- It doesn't have to be today, but keep it in your sights as a long-term goal.
- Being a good engineer makes you a terrific researcher.
- Nobody likes the MATLAB guy…

Advice #3: Aim for 50% Exploration - 50% Exploitation

- Leverage you hard-earned expertise, but devote half of your time to learning something new and uncomfortably different at all times.
- A career == 5-6 Ph.D.s - Don’t get them all in the same field!

If you don’t have a bad case of Impostor Syndrome,

you may be in the wrong place :)

Summary

- Industry Careers value Engineering ↔ Research Fluidity.
- Value the Process of Earning your Ph.D. over the Outcome.
- Strive to Become a Great Engineer.
- Aim for 50% Exploration - 50% Exploitation.

Questions?

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