



My Experience as Industrial Researcher

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My Grad School Experience

- PhD Computing Science, University of Alberta
- Advanced Man-Machine Interface (AMMI) Lab
 - Lots of interesting real-world applicable projects
 - Focus on graphics, visualization, signal processing and high-performance computing
- Supervisor (Pierre Boulanger), good industrial focus
 - Worked with industry for funding, etc.
- Learned about commercialization of research and entrepreneurship (workshops in Alberta)
- Would have done internships
 - Believe there is an internship program at MUN for grad students ?



Is Grad School Useful?

- Need a PhD to be a professor, certain government research jobs.
- Industrial research jobs as well in big tech research. (Google, NVIDIA, AI jobs, etc.)
 - Some of these companies even value PhD on the resume even when you are essentially going into a developer role that's not really a research position per say
- However, a lot of jobs really don't need a PhD
 - You trade all that time in school for time you could be getting hands-on experience in a job, probably getting paid more...
- Grad school is a lot of research training, seems a shame to waste the skills
 - Seemed a shame not to put the R&D skills to use in the end...

How grad school training is useful for industry

- Project management skills, seeing something big through to the end
- Independence, self-reliance
- Networking - you will get to know a lot of people and grow a network
- Producing something innovative
- Learn how your innovation can be useful for the world and have value for a market
- Talk about where it might have gaps later...

Funding in Industry

- SR&ED - tax credits
- NRC IRAP and others
- Provincial Gov - various programs, industrial post-doc program
- Industry-Academic collaboration funding (NSERC and others)
- NSERC and Mitacs research internships
- BCIP - first sale of new innovation to gov't
- Other localities have similar (SBIR in US)
- Many others!
- Informing potential employers or clients of R&D funding opportunities
 - demonstrating your value
 - convince entrepreneurs to take risks.

My Industry Experiences

- **GRI Simulations Inc. (2012-2015)**

- Oil and gas. Graphics and visualization R&D on existing products
- Established company with existing customers
- Lots of potential for R&D in this industry
- Was able to publish in industry focused conferences

- **Birch Scientific (2013-Current)**

- Helped with drilling start-up with successful exit (Marksman Ranging)
- Web development for Oil and Gas
 - Fast-paced, 24/7 operations, “real-world” problems
- Development of in-house IP (ongoing)

My Industry Experiences

- **Avalon Holographics (2015-Current)**
 - Start-up, no revenue (yet)
 - Purely R&D company. Developing holographic/light field displays.
 - Very ambitious; both exciting and frightening at times
 - Patents and been able to publish
- In all cases my grad school training has been very applicable:
 - Graphics, visualization, signal processing
 - Grant writing: SR&ED, NRC and RDC proposals, etc.
 - Seeing things through to the end amidst uncertainty

Academia vs. Industry

- (At risk of over-generalizing) Academia:
 - Success: Write lot of great papers, get lots of grants and have lots of people working for you.
 - Work a lot of hours (w/ no increase in pay?)
- Students are typically relatively inexperienced
 - They leave after a few years once they finally get momentum
- Faculty colleagues experienced but busy (not full-time focus)
- Well-funded labs can maybe avoid these pitfalls (don't mean to over generalize)
- We still need basic research driven by curiosity and intellectually interesting questions...

Academia vs. Industry

- Solution to intellectually interesting problem doesn't necessarily have a market ever or in any kind of immediate time frame that a typical investor is interested in.
- Industry:
 - teammates can be well-paid, experienced people
 - Full-time focus
- Work with variety of people (not just engineers and scientists)
 - Business, marketing, etc.

Observations and Experiences

- Industry: Resulting problem solving still very intellectually challenging and interesting like in academia
 - Perhaps more practical slant and focused on results
- Key is to pick a problem whose solutions results in a marketable product.
- Personally very interesting to see how things work out in the wild
- Private funding is generally skeptical about investing in academia
 - IP issues, etc. lots of barriers
- Academic “Science projects” vs. real marketable products
 - due to limited resources, not necessarily limited ideas and imagination

Observations and Experiences

- Skeptical of value of research and how it could result in saleable product
 - Need to understand why the risk is worth taking
 - Potentially not as 'blue sky' as you might be able to be in academia
 - Resources are limited; must get results to get back the investment
- Can be more geared towards industry telling them what they want and how
 - As opposed to being innovative and re-defining industry (not easy)
- Skeptical about working with university, academic credentials seen as not being practical.

Conclusion

- Your research training may not be a waste if you leave academia (not waste of time!)
- Other skills acquired in grad school are also applicable
- Lots of interesting problems in industry, particularly if seeing things help people make money is interesting to you
- Industrial gov't R&D funding in Canada, helps you get jobs, helps projects become possible in companies
- Industry can give chance to work on bigger projects, attract more resources
- Sense of practicality in industry can be refreshing