Inside Track
Is a PhD right for my career: a guide to engineering PhDs

Gareth Hughes – Faculty Employability Adviser
Dr Bryony Enright – Postgraduate Faculty Employability Consultant
Today’s Speakers

• Gareth Hughes – The engineering market (5)
• Bryony Enright – What is a PhD (7)
• Petar Zivkovic – Current EngD student (7)
• Ana Costache – Current Engineering PhD student (7)
• Nam Shatil - Current Engineering PhD student (7)
• Nima - Rolls Royce, an industry perspective on PhDs (10)
• Questions (5)
**Engineering in the UK**

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<th>Engineering drives productivity</th>
<th>Great prospects</th>
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<td>Engineering generated £455.6 billion GDP for the UK</td>
<td>The average graduate starting salary for engineering and technology is £27,079 - over a fifth more than for all graduates</td>
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<td>Engineering is 68% more productive than retail</td>
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<td>Employment has grown by 1.8% to over 5.5 million</td>
<td>Engineering companies are projected to need 182,000 people with engineering skills each year to 2022</td>
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<td>The number of registered engineering enterprises grew by 5.6% in the UK to 608,920</td>
<td>We need to double the number of graduates and apprentices entering the engineering industry</td>
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<td>Every time a new job is created in engineering, two more jobs are created elsewhere</td>
<td>Filling the demand for new engineering jobs will generate an additional £27 billion per year from 2022 to the UK economy – equivalent to building 1,800 schools or 110 hospitals</td>
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What is a PhD?

- A novel contribution to knowledge
- 3-5 years long
- Independently led research
- Highest possible academic achievement
- Validated by world experts
- Usually funded by a Research Council, University or Industry partner
- Essential for work as an academic (usually)
- Can be done part-time
How is an Engineering Doctorate (EngD) different?

- UK postgrad programme started in 1992 by Engineering and Physical Science Research Council (EPSRC)
- 4 years long
- For students that want a career in industry
- Combines PhD level research with taught courses
- Students spend 75% of time working directly with company
- Academic and Industrial supervisor
- Undertaken through an Industrial Doctorate Centre (EPSRC) at a University
PhDs in the UK

• 40% increase in last 5 years
• 19,000 awarded every year in UK
• Very high success rate (73% completion)
• Many are attached to a Centre for Doctoral Training (CDT), Doctoral Training Centre (DTC) or Industrial Doctoral Centres
• 42% of UK PhD students funded by Research Councils UK (RCUK)
Why do a PhD?

- Pursue a career in academia
- Passion for subject
- Intellectual challenge
- Competitive edge
- Opportunity to pursue a subject not available in working life

Things to consider:

- Are you avoiding getting a job?
- Is it necessary for your chosen career? – very common in some sectors (e.g. patent law)
Enhanced skills from a PhD

- Project and research management
- Self management, discipline and organisation
- Critical and independent thinking
- Ability to balance arguments and complex ideas
- Advanced research skills
- Prioritisation and goal setting
- Highly developed communication skills
- Many more, all in demand in many jobs
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The EngD Perspective

Petar Zivkovic
29/11/16
Academic Background

- University of Plymouth
  September 2011 – June 2014
  BSc (Hons) Marine & Composite Technology

- University of Bristol
  September 2014 – Present
  1. MSc Advanced Composites
  2. EngD Composite Manufacturing
     Sponsored by Rolls Royce
What is the Difference Between a PhD and EngD

- PhDs are typically 3 years (excluding CDTs)
- EngDs are typically 4 years

- PhDs are based in Academia
- EngDs are based in Industry

- PhDs mainly work on low TRL levels 1-3
- EngDs work on higher TRL levels 3-6

- EngDs get paid more
How did I find out about the EngD?
Why did I pick an EngD over a PhD

• I wanted to get a doctorate

• But I didn’t want to stay in Academia after

• I have 4 years of working with Rolls Royce on my CV

• We get payed more
Drawbacks of Doing an EngD

• You go to work in the morning

• You are neither a student nor an employee

• You are at the bottom of the pyramid at work

• You have two supervisors

• BUT YOU GET PAID MORE!!!
What is the IDC in Composite Manufacturing

10 Master Level Taught Units

Professional Training Development

Industry led Research Project

Year 1 | Year 2 | Year 3 | Year 4
What will I do after my EngD?

- Get a Job at Rolls Royce
- Go work in Industry
- Go work in Academia
- Go back Home
IS A PHD RIGHT FOR ME?

ANA COSTACHE

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WHY DO A PHD?

• Enhance your CV
• Collaborate and work with people all over the world
• Get experience in doing fun research
• Acquire skills such as: knowledge, autonomy and communication
THE STAGES OF THE PHD HUNT

• Think about what you want to do
• Talk to people!
• Identify your preferred positions and enquire about funding
• Apply
TOWARDS THE FUTURE

- Continue research and apply for a postdoc
- Work in industry
- Teach
Who? **Nam Shatil**

- Third year PhD Student in EngMaths (MVB)
- **Nam Shatil** - Nam.Shatil@bristol.ac.uk
- Research project on the **Atomic Force Microscope**
- UoB has the fastest microscope in the world
- Used for material properties characterisation
- Like a record player only a million times smaller
- Part funded by industry (EDF Energy and Sellafield)
- Non-engineering background
How?

• I knew I wanted to work in applied maths but I didn’t know where
• A PhD gives you time to investigate what you’re really interested in to a high level
• Contacted departments individual for internships and research roles
• Internship with HS-AFM at the NSQI Lab for three months
• Internship lead on to PhD project sponsored by industry

Day to day work:
• Mix of numerics, analytic work and experiments
Why?

- PhD gives you the freedom and responsibility to make your own education
- You’re not expected to know all the answers before starting
- Training from experts in their fields on solving real and important problems
- Research lets you find your own answers to problems
- Security of academia - important in the current uncertainty
- Opportunities to travel, use high level hardware and software, gain incredible experience and meet interesting and enthusiastic people
- No restrictions to staying in either academia or your specific research area afterwards
- Exposure to lots of varied research areas and projects
The Inside Track Seminar

University of Bristol
Dr Nima Ameri
29 Nov 2016
The PhD

2006-2009

PhD at University of Bristol

Morphing Aircraft Project

• “Morphing” defines alternative ways of controlling the aircraft dynamics through novel mechanisms (Shape Memory alloys, Truss structures, Piezos…)

• Deliver a tool for the preliminary design of Morphing Aircraft
The Post-Doc

2009-2012

Research Assistant at University of Bristol

AgustaWestland UTC (University Technology Centre)

• System Identification, Operation Modal Analysis
Rolls-Royce - Vibration

2013-2015

*Project Vibration Engineer*

*Rolls-Royce*

- Managing dynamic test from component level to full engine.
- Model Validation
- HiTEA (Highly Innovative technology enablers for Aerospace)
Rolls-Royce - Digital

2016-Present
Senior Analytical Engineer
Rolls-Royce

• Design of Diagnostic Network, Feature detection, analysis of Big Data
• In this department ~40% of the Team have a PhDs
Key Skills

Key academic skills that industry is looking for…

• *Highly specialized in a topic*

• *In-depth Analytical skills,*

• *Ability to work autonomously*

• *Network of people in the academic world*
Further information

Talk to tutors, academics and researchers in your Faculty

Careers Service:

- Careers Service website: ‘Options for further study’
  www.bris.ac.uk/careers/be-inspired/further-study/
- MyCareer Resources: ‘Alternative guide to Postgraduate funding’

Websites:

- www.findaPhD.com
- www.jobs.ac.uk/phd
- www.epsrc.ac.uk/skills/students/
- www.aengd.org.uk

Events:

Postgraduate study fair: postgradfair.co.uk/
Thank you

Any questions?