



**SIEMENS**  
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# From PhD Grad to Industry Expert

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Realize innovation.

# PhD Thesis

# Starting My PhD Thesis

June 2003: “Electro-Mechanical Engineer” (UCL)

Started PhD in September 2003 (ULiege)

Supervisor: Dr. Anne-Marie Habraken

Title: Numerical Simulations of the “SPIF”



- ▶ PdH Thesis
- ▶ Apply for a Job
- ▶ Company
- ▶ R&D Team
- ▶ Career Evolution
- ▶ How we Work
- ▶ PhD Skills
- ▶ Conclusions



## Numerical Simulations of the **Single Point Incremental Forming** Process

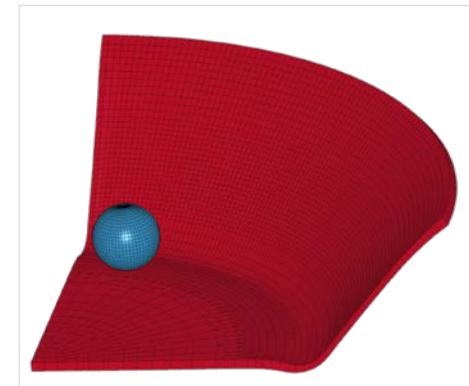
Software Development in the FE code “Lagamine”, to model metallic forming processes

### Main topics:

- Bibliographic study of forming process
- Structure of a Finite Element Code to reduce computation times
- Implicit vs. Explicit
- Contact Formulation
- Parallel Computation

Funded by a Research Project

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Manuscript available here: <http://bictel.ulg.ac.be/ETD-db/collection/available/ULgetd-04182009-184505/>

**Move to Industry**

## ...Then What?

Finished end of 2008 (graduated the following February)

Decided to apply for a job in private company

Main motivation? Wrote in my resume:

*I would like to work in industry to use my theoretical and research training in more practical applications.*

Success!

- Hired by Samtech S.A. in January 2009, only 2 months later

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# Why Samtech?

Spin-off of the ULiege (est. 1986) to develop and market SAMCEF

- Finite Element code started end of 1960s at the LTAS
- Customers include
  - Largest aerospace companies in Europe
  - Defense
  - Automotive
  - Energy (nuclear and wind)



SAMCEF now integrated in Simcenter Nastran (SOL402) and marketed worldwide

Samtech also develops aircraft sizing, wind-turbine and optimization products

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# The Whole R&D Team



Large R&D team of 21 people in Liege working on SAMCEF

- **Most of them hold a PhD...**  
... about half from the ULiege!
- Various backgrounds all working on the same product
  - Mechanical Engineering
  - Civil Engineering
  - Material Science
  - Electro-Magnetics
  - Fluid Mechanics
  - Acoustics
  - Parallel Computing
  - DevOps (source code management, builds and tools)

Collaboration with other teams in US and China

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# My Personal Career Evolution



- Hired by Samtech S.A. in January 2009
  - Started Software Engineer Specific tasks
  - After 2 years Project Leader Part of the product
  - After 6 years **Product Development Manager** **Up to 10 people**
  - After 11 years Software Development Architect 4 teams
- 2 careers opportunities
  - People manager
  - **Technical Expert**
- Money?
  - PhD value approximately 400 EUR gross / month for starting salary
  - With PhD, evolution perspective:
    - 100 – 200 EUR gross / month
    - 75 – 150 EUR net / month

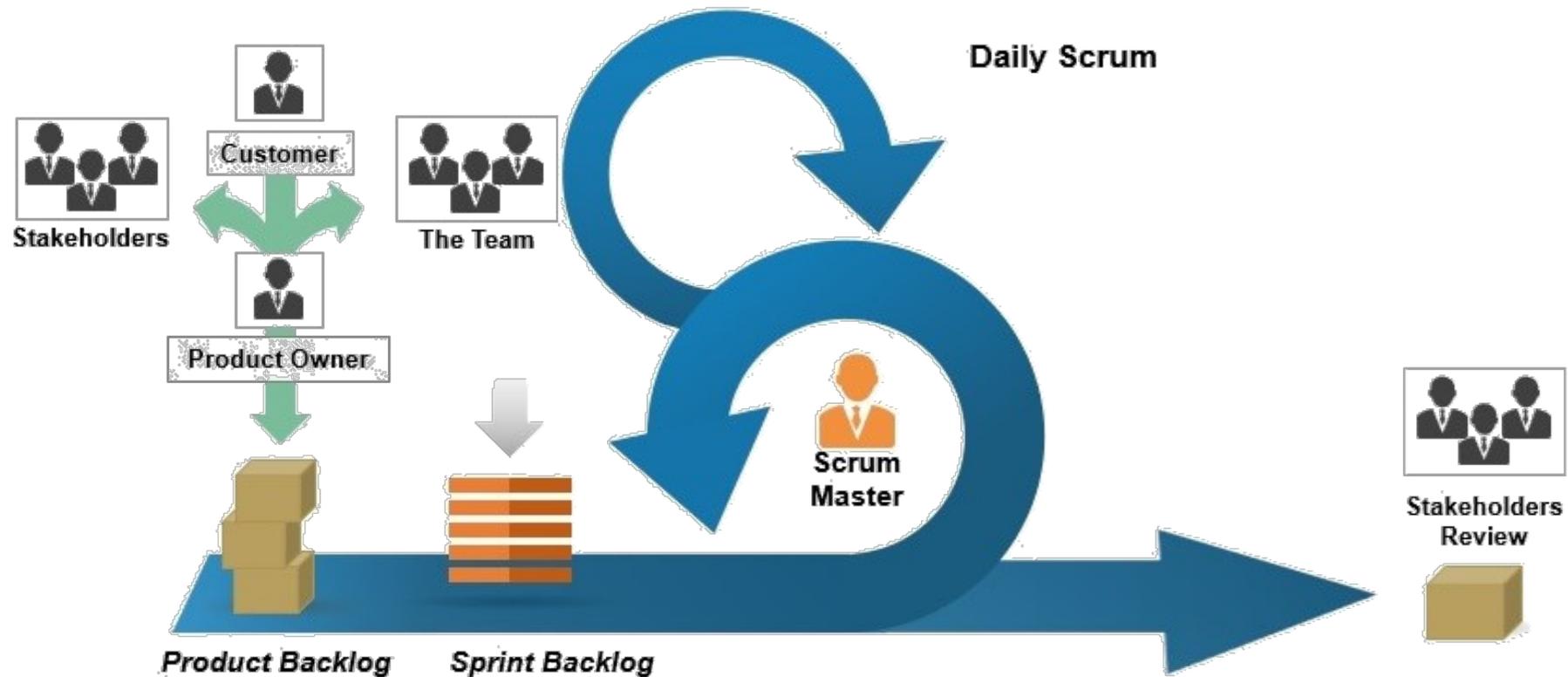
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**Skills**

# Our Methodology: Agile Product Development

All Siemens DISW products are developed using an Agile methodology (Scrum)

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# Developers' Day-to-Day Job

Based on a user story, a developer can either:

- Go straight to development (rarely)
- Start by gathering information through
  - Bibliographic review
  - Analysis of similar past projects
  - Prototyping
  - “Spike” (timeboxed analysis, short, concrete outcome)

<input type="radio"/>	Story ID:	Story Title:
<b>User Story:</b>		<b>Importance:</b>
As a: <role>		<input type="text"/>
I want: <some goal>		
So that: <some reason>		<b>Estimate:</b>
		<input type="text"/>
<b>Acceptance Criteria</b>		
And I know I am done when:		
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***Most skills learned throughout the PhD are highly valuable***

# Which PhD Skills?

## Technical skills

- Team work: the research is yours... but it does not mean you work alone!
  - Give a status report to your supervisor and agree on future strategy
  - Collaborate with other people involved in project
  - Discuss with colleagues
- Know where and how to find information
  - Perform a literature review
    - Think critically
    - Understand, extract and synthesize information
  - Find the right person
  - Design a plan to generate & analyze data to figure it out
- Structure a (very) large document
- Know how to finish a project
  - Nothing is 100%, identify perspectives
  - Set your own deadlines and try and meet them
- **Become an expert on a specific field starting from scratch**

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# Which PhD Skills?

## Soft skills

- Communicate in English
- Teach / coach students
- Plan and organize meetings
- Remain motivated for a long project
- Attend conferences
  - Prepare a presentation targeting to your audience
  - Talk in front of a group of experts
  - Travel to a different country for work
- Small talk with colleagues

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# Conclusion

# A PhD is a...

- Not only the path to an academic career...  
... but a bridge between your degree and industry
- **Unique** opportunity to
  - Keep on learning new skills... while being paid
  - Perform research without pressure from profitability
  - Be surrounded by experts
- Great personal journey



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# Questions?



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