dr. ir. Joren Pelfrene

Personal Data

Place and Date of Birth:	Ghent, Belgium | 18 November 1986
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Work Experience

Current
July 2017

Postdoctoral Researcher at Ghent University, Belgium
in Research Group "Mechanics of Materials and Structures"
Research project in collaboration with Bridon-Bekaert
Numerical modelling of composite materials
Thesis promotor for 1 Master student: experimental characterisation of pultruded FRP composite materials
Teaching activities: Practical course on design and production of fibre reinforced plastics (introductory level), supervisor of numerical thesis on composite violins (for Tim Duerinck)

Sep 2016
Feb 2012

Doctoral Researcher at Ghent University, Belgium
in Research Group "Mechanics of Materials and Structures"
PhD study on impact and blast loading on laminated glass facades: numerical simulation and experimental validation. Promotor: prof. dr. ir. Wim Van Paepegem
Member of COST Action TU0905 "Structural Glass", Task Group 7: Numerical Modelling
Invited to teach at ESR Workshop on numerical modelling of structural glass, EPFL Lausanne, Feb 2014
Teaching activities: Practical course on design and production of fibre reinforced plastics (introductory level), supervisor of 8 MSc thesis students
Award: best presentation at SIMULIA User's Meeting 2015

Up to 2011

Various summer jobs
Project7: damage repair of carbon fibre components at Le Mans 24h, 2009
Trefpunt VZW: technician for electrical installations during 4 editions of Gentse Feesten, 2 editions as head of electrical team

Education

2016 PhD in Electromechanical Engineering,
Ghent University, Belgium
Thesis: "Numerical Analysis of the Post-Fracture Response of Laminated Glass under Impact and Blast Loading"

2011 Master of Science in Electromechanical Engineering: Maritime Technology,
Ghent University, Belgium
Great Distinction | Major: Naval Architecture
Thesis: "Study of the SPH Method for Simulation of Regular and Breaking Waves"
Exchange Year at **Instituto Superior Tecnico**, Lisbon, Portugal

2009 Bachelor of Science in Electromechanical Engineering,
Ghent University, Belgium

Additional training

November 2018 Technology Transfer Skills,
Ghent University, Belgium
Funding of research and valorisation projects, intellectual property, valorisation contracts, entrepreneurship, negotiation skills, marketing & commercialisation, creativity in innovation

September 2014 MUSIC Summer School,
Leibniz University, Hannover, Germany
Multiscale Modelling of Interfaces and Advanced Solution Techniques,

April 2012 COST Training School "Structural Glass",
Ghent University, Belgium

Volunteering

2018 - 2019 Mentor2Work program: mentor for immigrant worker looking for engineering job
Minderhedenforum, Belgium

2013 - 2015 Mentoring program: mentor for ethnic minority student in engineering
Diversity and Gender Unit, Ghent University, Belgium

Languages

	Listening	Reading	Writing	Speaking
English:	Fluent	Fluent	Fluent	Fluent
Dutch:	Fluent	Fluent	Fluent	Fluent
French:	Fluent	Fluent	Fluent	Fluent
Portuguese:	Basic	Good	Good	Basic
Spanish:	Basic	Basic	Basic	Basic
German:	Good	Good	Basic	Basic
Italian:	Basic	Good	Basic	Basic
Indonesian:	Learning			

Skills & Experience

Software: ABAQUS:

- Python scripting for Abaqus; adaptive and parametric model approach
- Subroutines VUMAT, VUEL, UMAT, etc.
- Optimisation with iSight or sciPy coupling
- Fluid-Structure Interaction with SPH and CEL
- Fracture with element deletion, SPH, XFEM, VCCT and Cohesive Zone Method
- Nonlinear and anisotropic material characterisation for polymers and composites
- Modal analysis and steady-state dynamics
- Submodelling, Embedded Elements, Rebars
- Crash analysis with post-fracture behaviour

LS-DYNA:

- SPH for free-surface water waves
- Fracture simulation with element deletion and SPH
- Crash analysis with post-fracture behaviour
- Textile simulation with dynamic relaxation solver

Ansys Fluent, Calculix, SPHysics and Code-Aster: Experience with other FEA and CFD codes

GMSH: Mesh construction; export to ABAQUS or LS-DYNA

Mathematics: PyLab (Python alternative to Matlab), Maple, MS Excel

Programming: Python scripting & skills in C++, Fortran, Processing, QML

Other: LaTeX, MS Office, SolidWorks, FreeCAD, Linux OS

Technical: Experimental materials testing:

- Experience with hydraulic and electromechanical test benches for tensile and flexural testing
- Application of extensometer and strain gauges
- DMA testing of polymers (+ conversion of results into Gen. Maxwell model)
- Resonalyser method: developed own framework for quick and cheap stiffness characterisation
- Resistance technique for damage monitoring of CFRP in fatigue

FRP manufacturing with VIP, RTM, wet lay-up, prepreg and autoclave

Other: Teaching experience:

- Practical course on composites design and manufacturing (5 ac. years, BSc level)
- Introductory class to Abaqus FEM (MSc level)
- Introduction to user subroutines for Abaqus Explicit (PhD level)
- Numerical simulation of brittle fracture (PhD level, at EPFL)

Regular meetings and reporting for industrial partners (Bridon-Bekaert, Eastman, AGC)

Worked in research collaboration with TU Darmstadt, Eastman Co. and AGC

Active role in COST Action Task Group; organisation of pre-conference workshop

Published peer-reviewed articles and presented research at international conferences

Supervising and managing in total 11 Master students in their final thesis year

Interests and Activities

Ongoing project: building a large V-plotter robot by use of the Arduino-platform.

App development of 'Drum Machine', an offline drum sequencer for Sailfish OS smartphones.

Travelling and meeting people. Inline skating. Playing saxophone and EWI (electronic sax), electric guitar and building synthesizers with Axoloti. Enjoying arts and literature.

Publications

J. Pelfrene, S. Van Dam, and W. Van Paepegem (2015). "Numerical analysis of the peel test for characterisation of interfacial debonding in laminated glass". In: *International Journal of Adhesion and Adhesives* 62, pp. 146–153.

J. Pelfrene, J. Kuntsche, S. Van Dam, W. Van Paepegem, and J. Schneider (2016). "Critical assessment of the post-breakage performance of blast loaded laminated glazing: experiments and simulations". In: *International Journal of Impact Engineering* 88, pp. 61–71.

J. Pelfrene, S. Van Dam, J. Kuntsche, and W. Van Paepegem (2016). "Numerical simulation of the EN12600 pendulum test for structural glass". In: *Challenging Glass 5*. Ed. by J. Belis, F. Bos, and C. Louter.

J. Pelfrene, S. Van Dam, R. Sevenois, F. Gilabert, and W. Van Paepegem (2016). "Fracture simulation of structural glass by element deletion in explicit FEM". In: *Challenging Glass 5*. Ed. by J. Belis, F. Bos, and C. Louter.

J. Pelfrene, S. Van Dam, S Spronk, and W. Van Paepegem (2018). "Experimental characterization and finite element modelling of strain-rate dependent hyperelastic properties of PVB interlayers". In: *Challenging Glass 6*. Ed. by J. Belis, F. Bos, and C. Louter.

J. Pelfrene, S. Van Dam, and W. Van Paepegem (2014). "Numerical and experimental study of the peel test for assessment of the glass-PVB interface properties in laminated glass". In: *Challenging Glass 4 - Final COST Conference TU0905*. Ed. by C. Louter, J. Belis, F. Bos, and J.P. Lebet, pp. 513–519.

J. Pelfrene, S. Van Dam, W. Van Paepegem, and J. Degrieck (2013). "Numerical simulation of elastic, fracture and post-failure response of monolithic and laminated glass under impact loading". In: *COST Action TU0905: Mid-term Conference On Structural Glass*. Ed. by J. Belis, C. Louter, and D. Mocibob, pp. 413–420.

S. Van Dam and J. Pelfrene (2012). "Study on the mechanical response of glass facades under air blast loading". In: *Recent, Current and Near-Future Research on Structural Glass*. Ed. by J. Belis, pp. 39–44.

S. Van Dam, J. Pelfrene, S. De Pauw, and W. Van Paepegem (2014). "Experimental study on the dynamic behaviour of glass fitted with safety window film with a small-scale drop weight set-up". In: *International Journal of Impact Engineering* 73, pp. 101–111.

S. Van Dam, J. Pelfrene, K. Spranghers, D. Lecompte, and W. Van Paepegem (2013). "A new experimental test set-up for investigating impact resistance of laminated glass". In: *Conference Proceedings of the 21st DYMAT Technical Meeting*. Ed. by High Speed Imaging For Dynamic Testing Of Materials and Structures.

S. Van Dam, J. Pelfrene, W. Van Paepegem, J. Degrieck, D. Lecompte, and J. Vantomme (2013). "A new experimental test set-up for investigating impact resistance of laminated glass". In: *COST Action TU0905: Mid-term Conference On Structural Glass*. Ed. by J. Belis, C. Louter, and D. Mocibob, pp. 359–366.

S. Van Dam, J. Pelfrene, W. Van Paepegem, and D. Lecompte (2014). "Mechanical response of laminated glass plates subjected to impact loading". In: *Challenging Glass 4 - Final COST Conference TU0905*. Ed. by C. Louter, F. Bos, J. Belis, and J.-P. Lebet, pp. 473–480.

W. Van Paepegem, L. Daelemans, J. Pelfrene, I. De Baere, N. Lammens, G. Chiesure, G. Luyckx, S. Jacques, J. Vanwalleghem, and J. Degrieck (2015). "Added value of micro-tomography measurements in mechanical characterization of materials: some case studies in engineering applications". In: *2nd UGCT seminar, Ghent, Belgium*. Ed. by M. Boone and J. Van den Bulcke.