

# SACHEEN BEKAH

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## QUALIFICATIONS

Outstanding research skills garnered two promotions from automotive supplier. Work well independently and with team in research and teaching environments. Speak, read and write English and French fluently.

## EDUCATION

**DOCTOR OF PHILOSOPHY, Mechanical Engineering**, September 2007 - Present

McGill UNIVERSITY, Montreal, Quebec, Canada

Dissertation: Numerical models for the deformation and fracture of mineralized biological materials

**MASTER OF APPLIED SCIENCE, Mechanical Engineering**, April 2004

RYERSON UNIVERSITY, Toronto, Ontario, Canada

Dissertation: A numerical model for the crack initiation and fatigue life prediction of a door hinge system under multi-axial loads.

**BACHELOR OF ENGINEERING, Aerospace Engineering**, April 2002

RYERSON UNIVERSITY, Toronto, Ontario, Canada

Dissertation: A finite element model for the Beechcraft Bonanza F33 wingbox using ANSYS.

## AWARDS AND SCHOLARSHIPS – TOTAL VALUE \$ 70,000

- Graduate Student Assistantship, McGill UNIVERSITY, 2007, 2008 (\$ 36,000)
- Dennis Mock Graduate Scholarship, RYERSON UNIVERSITY, 2002, 2003 (\$ 10,000)
- Graduate Student Assistantship, RYERSON UNIVERSITY, 2002, 2003 (\$ 24,000)

## RESEARCH EXPERIENCE

McGill UNIVERSITY, Montreal, Quebec, Canada

Sep 2007 - Present

Position: Ph.D. student

Supervisor: Prof. F. Barthelat

- Development of a numerical model for the deformation and fracture of mineralized biological materials

RYERSON UNIVERSITY, Toronto, Ontario, Canada

Sep 2002 - Apr 2004

Position: MAsc. student

Supervisors: Prof. K. Behdinin, Prof. Z. Fawaz, Dr. K. Farkas (VAN-ROB AUTOMOTIVE)

- Development of a numerical model for the crack initiation and fatigue life prediction of a door hinge system under multi-axial loads. A joint industrial research project co-supervised by RYERSON UNIVERSITY and VAN-ROB AUTOMOTIVE.
- Worked closely with Research and Development Engineers at VAN-ROB AUTOMOTIVE for the development of an experimental set-up to test door-hinges under uni-axial and multi-axial loads.
- Conducted experiments to validate the numerical model through a full-scale multi-axial durability testing facility at VAN-ROB AUTOMOTIVE.
- Co-authored and presented paper at the CSME Conference 2004 held at the University of Western Ontario, London, Ontario, Canada. Title: “Crack initiation and fatigue life prediction of a door hinge system under multi-axial loads, a numerical model and experimental study”.

RYERSON UNIVERSITY, Toronto, Ontario, Canada

Sep 2001 - Apr 2002

Position: Undergraduate student

Supervisors: Prof. K. Behdinin, A. Tsoulis (BOEING AEROSPACE)

- Development of a finite element model for the Beechcraft Bonanza F33 wingbox. A joint industrial research project co-supervised by RYERSON UNIVERSITY and BOEING AEROSPACE.

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## PROFESSIONAL EXPERIENCE

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VAN-ROB AUTOMOTIVE, Aurora, Ontario, Canada

**Computer Aided Engineering Specialist** for tier-1 automotive supplier

Mar 2004 to Aug 2007

Supervisors: Dr. K. Farkas, Dr. S. Li.

### ACCOMPLISHMENTS

- Promoted from Jr. CAE Specialist to CAE Specialist within three months of employment for excellent research skills.
- Promoted to Lead CAE Specialist on Future Programs because of participation on General Motors projects for which company received GM Supplier of the Year Award.
- Won Global Delta engine cradle program, first of its kind in Van-Rob history, by participating in technical reviews at GM Europe and presenting alternative engineering design solutions to GM engineers.
- Conducted multiple computer-aided engineering simulations to test innovative concepts in project that reduced cost of radiator support assembly for the Cadillac Escalade 40% by changing from aluminum to steel construction without weight or performance penalty.
- Saved \$1M per year by developing and implementing weight- and cost-minimizing technique with identical product performance on instrument panel beam assembly for Ford F150 truck series.
- Avoided cost penalty by eliminating multiple experimental tests on multiple welding sequence concepts with technique that conducts CAE-based coupled thermo-mechanical analysis to reduce welding-induced thermal distortion on the Pontiac Solstice frame rail.
- Mastered theory of finite element analysis (FEA) and finite difference method (FDM) and practice of using commercial software packages for conducting linear and non-linear analyses in implicit and explicit code solvers.
- Mastered technique of mathematical modeling for durability analysis and fatigue life prediction in project initiated in graduate school research thesis. Technique has been successfully implemented into Global Delta engine cradle and validated through experimental uni-axial durability testing.
- Proficient in Hyperworks product family, MSC Software product family, LS-DYNA, ABAQUS. Program in FORTRAN and MATLAB.

KIRCHHOFF AUTOMOTIVE GRUPPE GmbH, Attendorn, Germany

**Resident Engineer** on behalf of Van-Rob Automotive

Sep 2006 - Oct 2006

Supervisor: Dr. Ing. C. Wagener.

### MAIN PROJECTS

#### **Chassis and Instrument Panel structures on General Motors, Ford, Mazda and Honda platforms**

Joint CAE Engineer for:

- CAE simulations for static stiffness, octave mobility drive, durability and crash/safety analyses.
- CAE based Design of Experiments (DOE) and Multi-disciplinary Design Optimization (MDO) to meet product performance.
- CAE simulations and performance improvement for Noise, Vibration and Harshness (NVH) and knee impact energy absorption analyses.
- Assisted in validation and testing for uni-axial component and subsystem durability for CAE correlation.

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## TEACHING ASSISTANTSHIPS

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McGill UNIVERSITY, Montreal, Quebec, Canada

Sep 2007 - Present

- Mechanics of Deformable Solids: Solves problems in engineering mechanics in a tutorial/seminar format. Supervisor: Prof. E. Fried
- Mechanics of Deformable Solids: Solves problems in engineering mechanics in a tutorial/seminar format. Supervisor: Prof. P. Hubert
- Design Graphics: Instructed a thirteen week laboratory course using AutoCAD. Evaluated student performance on assignments and projects. Supervisor: Prof. D. Pasini
- Mechanics III: Solved problems in mechanical vibrations in a tutorial/seminar format. Evaluated student performance on assignments and projects. Supervisor: Prof. S. Price

RYERSON UNIVERSITY, Toronto, Ontario, Canada

Sep 2002 - Apr 2004

- Space Systems Design: Evaluated student performance on assignments and projects. Supervisor: Prof. J. Enright
- Flight Mechanics: Solved problems in flight mechanics in a tutorial/seminar format. Evaluated student performance on assignments. Supervisor: Prof. H. Alighanbari
- Finite Elements in Engineering: Solved problems in finite elements in a tutorial/seminar format. Instructed a thirteen week laboratory course using ANSYS. Evaluated student performance on assignments and projects. Supervisor: Prof. K. Behdinan
- Mechanisms and Vibrations: Solved problems in mechanisms and vibrations in a tutorial/seminar format. Instructed a thirteen week laboratory course using MSC.ADAMS. Evaluated student performance on assignments. Supervisor: Prof. S. Yu
- Dynamics: Solved problems in engineering dynamics in a tutorial/seminar format. Evaluated student performance on assignments. Supervisor: Prof. K. Behdinan

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## PROFESSIONAL AFFILIATIONS

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American Institute of Aeronautics and Astronautics, Young Professional Member since October 2004.

Professional Engineers of Ontario, Professional Engineering License Membership expected March 2010.