ASHOK KAUSHAL Ph.D, P.Eng
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Summary

- Senior Lead Engineer with 18+ years' experience in managing projects and people
- Technical and team leading skills - technical and project deliverable authority
- Maintain and develop relationships with project stakeholders and company experts in Canada, USA and the UK
- Extensive and diversified experience in dynamics and vibration analysis/testing.
- Excellent knowledge of the finite element method(s) and application(s)
- Experienced in rotor dynamics, modal and vibration testing, qualification, and test / analysis correlation.
- Familiar with ISO and API standards
- Thorough analytical and problem solving skills with strong foundation and application of basic engineering principles.
- Experience in coaching, mentoring and risk management.
- Responsible for risk evaluation mitigation and communicating risks to upper management.
- Extensive experience in high-level presentations and design reviews; excellent communication skills.
- Report project progress and key performance indicators to upper management; able to influence decisions at senior levels
- Identification and implementation of Continuous Improvement initiatives
- Experienced in initiating and managing outsource contracts to offshore Engineering firms.

Education

Ph.D. - MECHANICAL ENGINEERING 1985-1992
Concordia University, Montréal, Québec
Research thesis "***Comprehensive Dynamic Analysis of a Bladed Disk-Turborotor-Bearing System"***

M. Eng. - MECHANICAL ENGINEERING 1983-1985
Concordia University, Montréal, Québec.
Research thesis ***"Dynamic Analysis of Rotating Structures"***

B. Eng. - MECHANICAL ENGINEERING 1979-1982
McGill University, Montréal, Québec

Scholarships & Grants

IRAP Grant	2017
NSERC Engage Grant	2015-2016
NSERC Engage Grant	2012-2013
Rolls Royce	2009-2011
Industrial Research Fellowship	1993-1994
Graduate Fellowship	1989-1992
FCAR Fellowship	1986-1989
Graduate Fellowship	1983-1986

Professional Memberships

- Member of the Professional Engineers Ontario (PEO)
- Canadian Representative - IFToMM Technical Committee for Rotordynamics

Professional Experience

Concordia University, Dept. of Mech., Ind. and Aerospace Eng., Montréal, Québec, Canada

Senior Lecturer- (Extended Term Appointment -ETA):	***2015-Present***
Affiliate Professor	***2023-Present***
Chair -Capstone Design Committee	***2015-Present***
Graduate Program Director (GPD)- M.Eng. Program	***2018-Present***
Assistant Professor - Limited Term Appointment -LTA)	***2014-2015***
Affiliate Assistant/Associate Professor:	***1992 – 2014***

- Faculty Advisor - SAE
- Conducting research in the area of dynamic analysis of rotating structures. A complete investigation of the aircraft turbo rotor system studying the vibration behavior under free and forced conditions along with stress analysis is initiated. An experimental setup to validate the analytical results was also developed; Co-supervision of graduate students

Undergraduate Courses Assigned

- Statics, Dynamics, Technical Drawing, Instrumentation and Measurement, Mechanical Modelling of Systems, Computer Aided Mechanical Design, Design and Analysis of Mechanical Structures, Engineering Mathematics, Product Development and Numerical Methods.

Graduate Courses Assigned and Developed

- Concurrent Engineering in Aerospace Systems; Dynamic Analysis of Mechanical Systems; Computer Aided Mechanical Design

Graduate Research Projects and Thesis Supervised

- Ph.D Thesis- Co Supervisor – Mr, Abhishek Barat (Started 2019)
- ENGR 6971 Development of Equivalent Plate Analysis technique & Design of Cessna C13 Citation Wing (2017)
- ENGR 6991- Project Report: Fluid-Structure Interaction for Aerodynamic and Structural Dynamic Analysis of Centrifugal Compressor using ANSYS (2015-2016)
- ENGR 6991- System Failure Modes Effect on an in Service Aircraft(2015-2016)
- ENGR 6971 Advanced Concepts to Improve the Fuel Efficiency and Reduce Emissions through Engine Cylinder Deactivation (2015-2016)
- ENGR 6981- The future of 3D Printing in the Aerospace Industry (2014-2015)
- M. Eng Thesis – Analysis of Rotor Dynamics Acceptance Criteria in Large Industrial Rotors (2013)
- Ph.D Thesis "Development, Implementation and Testing of an Expert System for Detection of Defects in Gas Turbine Engines" (Finished 2008)
- M. Eng. (6 Credit Project) "Feasibility study of Micro-machined Capacitive Inductor sensors for Acoustic Intensity Measurement" (Finished Oct. 99)

Senior Specialist Engineer – Technical Lead/Subject Matter Expert (SME): ***Jan. 1997 – May 2014***
(Sept. 1998 – Aug. 2000 - Contractual Basis)

Rolls-Royce Canada (RRC), Dorval, Québec, Canada

- Technical Authority for Vibrations and Testing. Responsible for the planning, resourcing, supervision and technical quality of component modeling, analysis and validation activities within the Rolls-Royce Energy Business (U.S.A, U.K and Canada).
- Active member of the corporate Global Methods Council(s), regularly attending face to face conferences and interacting with colleagues from other Rolls-Royce sites, participating in the development and implementation of corporate analysis strategies and methods.
- Act as technical and project deliverable authority for the design and integrity of new and redesigned components.
- Review data and drawings for compliance with gas turbine engine standards.
- Perform/Supervise mechanical design and analysis of the gas turbine engine components.
- Define validation requirements (components and total system) for vibration analysis, interpret test data in correlation with the analysis and support validation of the definition.
- Support the Customer Facing Business Unit in resolving customer issues and enhancing the capabilities of the product base. Support the Advanced Product Team in the definition and early assessment of new designs.
- Determine engine and component test requirements and analyze data from engine running.
- Deliver system synthesis of the whole turbine (dynamics and interface) and the analysis of design behaviors over the gas turbines operating range.

- Define relevant rig and engine tests to be done and liaise with the development group for test preparation;
- Interpret test data and issue reports for the purpose of validating the design.
- Perform modal analysis of development components.
- Ensure suitable safety factors for safe operation, providing added value to the product.
- Lead multiple teams for investigating failure analysis.
- Initiate and manage outsource modeling and analysis contracts to offshore engineering firms.
- Other tasks:
  Mentor newly hired employees; Evaluate employee performance
  Interview new employees and participate in their selection
  Wrote local operating procedure(s) for the company

Expert Reviewer-Technical: ***Dec 2011- Present***
Sustainable Development Technology Canada (STDC) Ottawa, Ontario

- Evaluate technical merits of projects presented to SDTC and recommend acceptance or rejection of funding.

Assistant Professor: ***Sept.1998 – Aug.2000***
Ryerson University, Toronto, Ontario, Canada
Undergraduate Courses Assigned
- Technical Drawing, Material Selection, Machine Design II, Stress Analysis II, FEM Analysis

Graduate Courses Developed-Random Vibrations, Rotor Dynamics and Dynamic Analysis of Mechanical Systems in a Thermal Environment

Project Officer: ***Oct. 1995 - June 1996***
Naval Engineering Test Establishment (NETE) Lasalle, Québec, Canada

- Planned, budgeted, scheduled and managed engineering projects for the Department of National Defense
- Provided consulting service and assisted DND personnel in policy decision making;
- Directed and supported several projects ranging from investigation to system development and implementation;
- Performed investigation, evaluation, development and management of equipment health monitoring techniques for marine and combat systems;
- Conducted machinery condition examinations via vibration & reliability analysis techniques;
- Prepared software development specifications for engineering analysis.

Mechanical Design Specialist: ***Jan. 1993 - April 1994***
Industrial Research Fellowship
Canadian Aviation Electronics (CAE), Saint-Laurent, Québec, Canada
- Performed structural, thermal and vibration design/analysis of components utilized on Canadian Space Station Freedom using analytical and finite element technique(s);
- Conducted design verification and trade-off using finite element modeling techniques;
- Performed mechanical design, dynamic modeling, and non-linear analysis of various components used in aircraft, marine, and power simulators;
- Conducted structural/fatigue analysis and thermal design of mechanical enclosures containing electronic equipment subject to various environmental conditions;
- Responsible for the mechanical testing of surface mounted components on the PCB's and the Video Distribution Unit utilized on the Canadian Space Station Freedom;
- Reviewed design activities and solutions to comply with engineering requirements;
- Integrated and provided technical support to other members and departments during design, testing and implementation phases;
- Conducted test design, generated technical specifications, qualification and acceptance test plans, test interpretation and preparation for delivery requirements.

Faculty Chairman / Professor: *1987 - 1992*

Vanier College CAD/CAM Institute
Centre Spécialisé du Québec, Montréal, Québec, Canada

- Faculty chairman of the staff with approx. 50 part-time teachers;
- Conducted project supervision for research and development projects;
- Provided consultation services in the implementation of design procedures and development of customized CAD application software for various companies. Responsible for the evaluation and operation of all CAD/CAM software and hardware at the institute;

Part Time Employment

Professor: 1992 - 2018
Concordia University: Dept. of Continuing Education, Montréal, Québec, Canada

- Computer Aided Design (AutoCAD), C programming and other computer related software to various industrial participants.

Computer Skills

Platforms	PC, and Unix
CAD/CAM	AutoCAD, Cadkey,Solidworks
Finite Element Analysis	Nastran/Patran, Ansys, SC03, NX-Nastran
Programming Languages	Expert System Shells
Multimedia and Spreadsheet	Microsoft Word, Excel and MS PowerPoint.

Book Publication

"Numerical Analysis", R. Bhat & A. Kaushal, Alpha Science Publishers ISBN 978-1-78332-346-3

Publications

1. Mittal, P., Kaushal, A., "*Study of various factor impacting aerodamping of axial transonic fan stage of gas turbine"*, 20th International Conference on Experimental Mechanics (ICEM 20 – 2023), Portugal,2023
2. Barat. A., Vermeire, B., Kheiri, M., Kaushal, A., *"Linear and non linear elasticity using the Flux Reconstruction Approach" ,CSME, Canada,2023*
3. Razi1, M., Jahromi A.F., Bhat, R. , Kaushal, A., Surial, A., "*Curve Veering in Rotor-Bearing Systems Using Finite Element Method*", International Conference on Emerging Trends in Engineering (ICETE – 2013), India,2013
4. Taraboulsi, G, Ahmed, A.K., Kaushal, A., "*Mathematical Modeling and Experimental Results of the Dynamic Response of a Misaligned Rotor System",* Advances in Vibration Engineering Journal, Vol. 10 no. 1, 2011
5. Kaushal, A. & Surial, A, " *Analytical Assessment and Experimental Correlation of a Rub Induced Vibration of an Industrial Gas Turbine Engine*", NAFEMS World Congress- Conference, Boston, May 23-26, 2011
6. Kaushal, A. & Surial, A. "*Dynamic Analysis of a Variable Speed Industrial Gas Turbine Engine and Drive train - Analysis and Testing"* The Scientific Journal of the Vibration Institute of India, Vol. 4, No.3.,2005, pp.279-286.

7. Kaushal, A. & Surial, A. "*Dynamic Analysis of a Variable Speed Industrial Gas Turbine Engine and Drivetrain - Analysis and Testing"* VETOMAC 3 & ACSIM, India, Dec.6-9, 2004

8. Kaushal, A. & Surial, A. "*Coupled Vibration Analysis of an Industrial Gas Turbine Engine & Drivetrain - Analysis and Testing*" ISCORMA-2, Poland, August4-8, 2003

9. Kaushal, A "D*evelopment, Implementation And Validation Of A Vibration Expert System For Gas Turbine Engines",* IMAC-XXI- Conference on Structural Dynamics, Florida, Feb3-6, 2003.

10. Kaushal, A. *"Axi-Symmetric Vibrational Analysis of Rotating Disks with Radially Varying Thickness Using Characteristic Orthogonal Polynomials"*, DYCON99, Vibration of Continuous Systems, Ottawa, August 5-8, 1999

11. Kaushal, A., Surial, A. " *Dynamic Analysis of a Flexible Turbo-Rotor System Using Super-Elements*", MSC Aerospace Conference, California, June 7-10, 1999

12. Kaushal, A. " *Teaching Engineering Drawing Using Multimedia Tools*", Annual Ryerson Faculty Conference, Toronto, May 12-13, 1999

13. Kaushal, A., Giangrande, I.,*" Development, Implementation and Validation of a Vibration Expert System"* IASTED International Conference on Artificial Intelligence, Expert Systems and Neural Networks

14. Kaushal, A., Bhat, R.B., *"A Comparative Study of Vibration of Plates with Cutouts Using Finite Element and Rayleigh-Ritz Methods"*, 14th Canadian Congress of Applied Mechanics, CANCAM'93, Kingston, 1993.

15. Kaushal, A., Bhat, R.B., *"Comment on Vibration and stability of Rotating Free-Clamp Slicing Blades"*, *Journal of Sound and Vibration*, Vol.137, 1990, pp. 139-141.

16. Kaushal, A., Bhat, R.B., *"Tangential Velocity Effect on the Dynamic Behavior of Turbine Blades"*, Twelfth Biennial ASME Conference on Mechanical Vibration and Noise, Vol. 18-3, 1989, pp. 210-206.

17. Kaushal, A., Bhat, R.B., *"Axisymmetric Vibration of Rotating Circular Plates Using Characteristic Orthogonal Polynomials"*, Twelfth Canadian Congress of Applied Mechanics, 1989, pp. 94-95.

18. Kaushal, A., Bhat, R.B., *"Lateral Vibration of Rotating Cantilever Beams Using Beam Characteristic Orthogonal Polynomials in Reissner Method"*, 2nd International Conference on Rotor Dynamics and Transportation Phenomenon, 1988, pp. 465-480.

19. Kaushal, A., Bhat, R.B., *"Natural Frequencies and Mode Shapes of Rotating Structures Using Improved Strain Energy Formulation in Rayleigh Ritz Methods"*, Proceeding of the 3rd Int. Modal Analysis Conference, 1985, pp. 574 - 583.

20. Kaushal, A., Bhat, R.B., *"Vibration of Plates Using Orthogonal Polynomials in Rayleigh Ritz Method"*, Proceeding of the 19th Midwestern Mechanics Conference, 1985, pp. 173-174.

References

- Available upon request.