Curriculum Vitae

Personal data

Claes Fredö, 1963-06-16, Swedish
Married, two children

Education

- PhD, Technical Acoustics, Civil Engineering, Chalmers University of Technology 1995
- Lic.Eng., Technical Acoustics, Civil Engineering, Chalmers University of Technology 1993
- M.Sc. Mechanical Engineering, Chalmers University of Technology 1989

Languages

- Swedish - Very good
- English - Very good
- German - Basic
- Norwegian - Basic

Employment

- Qring Technology AB, 2007 - Present. Pricipal Consultant
- ÅF-Ingemansson AB [a.k.a. DNV-Ingemansson, Ingemansson Automotive, Ingemansson Technology] 1996-2007: Senior Consultant
- Chalmers University of Technology 1990-1995: Research student
- Chalmers Industrial Technology 1988 - 1990: Consultant

Publications

1. J.C.O. Nielsen and C.R. Fredö, *Multi-disciplinary optimization of railway wheels*, J.SoundVibration, 293(3-5), p 510-521, 2006
2. C.R. Fredö, *A modification of the SEA equations: A proposal of how to model damped car body systems with SEA*, SAE 2005-01-2436, SAE 2005 NVH Conference in Traverse City.
3. C.R. Fredö, A. Hedlund, *NVH optimization of truck cab floor panel embossing pattern*, SAE 2005-01-2342, SAE 2005 NVH Conference in Traverse City.
4. C.R. Fredö, *SEA-like approach for the derivation of energy flow coefficients with a finite element model*, J.SoundVibration, 199 p. 654-666 1997
5. *C.R. Fredö*, *A Note on Conservative and Non-Conservative Coupling*, Proceedings of the IUTAM Symposium held in Southampton, UK 8-11 July 1997, editors Fahy, F.J.; Price, W.G.
6. FREDÖ, C R; LAVENO, A; SVENSSON, J; WILMAR, O; BRUNNER,O – *Force Measurements during Vibration Tests with Sinusoidal Base Excitation*, Proceedings European Conference on Spacecraft Structures, Materials and Mechanical Testing, 1997.
7. C.R. Fredö Ph.D. Thesis, *Statistical Energy Analysis and the Individual Case* Chalmers University of Technology, (1995).
8. M.A. Sanderson and C.R. Fredö *Direct Measurement of Moment Mobility, Part I: A Theoretical Study*, J.SoundVibration, 179(4), p. 669-684 1995
9. C.R. Fredö, Lic. Eng. Report F93-01, *Derivation of energy flow with a finite element model*, Chalmers University of Technology, (1993).
10. C.R. Fredö - about 40 conference papers on various subjects 1990-2007

Patents

1. C.R. Fredö and J Wigaard, (WO/2005/114035) VISCO ELASTIC DAMPING IN A PIPING SYSTEM. **Short description**: Small Bore Fittings (SBFs) account for a large degree of vibration related fatigue failures on gas and liquid carrying piping. Such malfunction can have serious impact on health, safety, environment and economical aspects of plant operation. Damper link elements are applied to improve SBF robustness against vibration - thereby reducing risk and improving SBF fatigue life.
2. C.R. Fredö and A. Hedlund, (WO/2006/052210) STRUCTURAL ELEMENT. **Short description**: An optimization method for stiffening of plate type structural elements is invented. Stiffening is made using computed mode shapes that are imprinted on the original structural element. Use of structure modes or problem vibration shapes is demonstrated to be a very good choice of stiffening pattern. Optimization can be made in several ways and toward multi-disciplinary targets, e.g. localisation of stiffness into designed frequency ranges or tuning of individual modes. The optimization method was benchmarked with favourable results against a commercial shape optimisation product.

Professional Experience

Project examples:

- Car audio system component measurement and analysis, 1989
- Acoustic experimental modal analysis of premium car, 1989
- Measurement error analysis for in-cell powertrain sound power measurement, 1989
- Development of high performance acoustic insulation hangar door system, 1996
- Troubleshooting power steering system pulsation/vibration for premium car, 1996
- Model correlation & updating of FE model for pipe systems in a large building, 1996/7.
- Model correlation & updating of 6-dof Force Measurement Device and ESA Olympus Satellite model, 1996/7.
- Design of building modification for installation of heavy machinery, 1997.
- R&D of vibro-acoustic design methods for heavy vehicle cabs, 1997-2005
- R&D of vibro-acoustic design methods for hearing aids, 1999
- Design of quiet main generator set up for Kvitebjørn platform, 1999-2000
- Design modification of light bus exhaust system, 2000.
- R&D of vibro-acoustic design methods for heavy vehicle power trains, 2000-2005
- Troubleshooting gear whine problem for premium car, 2001-2002.
- Speed test of cardboard winder, 2001-2006.
- Advisory consulting for design based purchasing, 2002.
- Troubleshooting gas export compressor piping pulsation/vibration, offshore north sea platform, 2003-2007
- Acoustic fatigue load analysis of satellite antenna, 2001-2007
- Troubleshooting of vibration problem in luxury yacht, 2005.
- Multi-disciplinary optimization of train wheel wrt radiated noise, weight and fatigue, 2005.
- R&D for oven vibro-acoustic design. 2005.
- Development and application of in-pipe pulsation measurement using externally applied sensor. 2005.
- Design of high performance vibration isolation set up for FTF Nanolab at Lund University, 2005-2007
- 3rd party 'troubleshooting' of screw compressor and problem identification using sound from video recording and reports written by other party, Norwegian sector, 2007.
- On-site troubleshooting reciprocating gas export compressor pulsation/vibration and steam turbine, offshore Africa FPSO, 2006/7
- On-site troubleshooting of two systems in Nuclear facility, simulation and FE analysis for redesign. 2007-2008
- Research project on detection of fouling in waste furnace using vibration data. Värmeforsk. 2008-2010.
- Electrum Laboratory, Measurement and analysis of vibration in relation to new tram installation. 2009.
- On-site troubleshooting mudpump and project work on redesign of piping system for improved vibration robustness, how to remove shock and pulsation, Norwegian Sector 2008-2015
- Ekofisk 2/4L, FE design of new wall system, advanced testing on mockup and analysis, SMOE via Markhus AS, 2010-2011.
- Maxlab IV synchrotron radiation facility, Lund. Principal Advisor and 3rd party review. 2010-2013
- Participation in FEED studies for Aibel:
    - Gudrun
    - Troll A, TPC34, also A- and B- studies.
    - Ekofisk 2/4L
- Participation in EPC studies for Aibel:
    - Kvitebjørn. Analysis of structureborne sound transmission in platform using SEA.
    - Kvitebjørn, via Dresser-Rand. Design of a 2-stage AVM system for main generators.
    - Kollsnes plant. Design of damping countermeasure to reduce risk for Small Bore fatigue in gas piping.
    - Volve, FE analysis of deck vibration and countermeasure design.
    - Alvheim FPSO, FE analysis of deck vibration and countermeasure design.
    - Ettrick FPSO, FE analysis of deck vibration and countermeasure design.
    - Troll A, TPK system. Acoustic FE analysis and aeroacoustic troubleshooting wrt flow induced pulsation. Sea water return caisson. On-site measurement and analysis.
    - Kvitebjørn risers. Advisory consulting on the simulation of damping.
    - TC Mongstad. Aeroacoustic analysis, FE analysis of infrasound transmission through pipeshells, FE analysis of acoustic modes and advisory consulting.
    - Oseberg C updating of mudystem. Design of a vibration decoupling system for new Triplex mudpump.

- Root cause investigations for
    - Flow induced noise source(s) identification and countermeasure design at offshore drilling rig. Aibel AS and Oddfjell Drilling AS
    - Piping vibration using triplex pumps for fracking. CopNo.
    - Novel pump design and piping vibration. Equinor AS.
    - 1.7 MW VSD fluegas fan. Kraftringen Energi AB
    - Boiler pulsation, Kraftringen Energi AB
    - Inline two stage flue gas fan. EON AB. Aibel AS/Equinor AS.
    - Singing oil wells and slugging. Exxon Angola.
    - GoBiGas, vibration problem identification. Göteborg Energi AB.
    - Various installations in the Swedish nuclear industry.
        - Piping
        - Generator sets
        - Emergency pumps
        - etc.
    - Unexpected valve closure for steam pipe and aeroacoustic source identification. Valmer Power AB
    - Citybanan tunnel, Trafikverket.
    - Various hydropower installations (Kaplan) for Sydkraft Hydropower AB
    - Steam turbine + generator for Gävle Energi AB
    - Steam driven emergency generator. Renova Miljö AB.
    - Advanced X-Ray machine. Morpho Detection Intl. Inc.
- Various
    - Countermeasure for piping vibration from fracking. Aaker Kvaerner AS.
    - Countermeasures for noise from Water Injection unit at Maria platform. Aibel AS.
    - Decoupling of tripex pump to mitigate platofrm vibration. Aibel AS and Equinor AS:
    - Towed wind power base. MT Højgaard A/S
    - Third party reviewer for platform concept. Equinor AS.
    - Third party reviewer for structure-borne sound risk from heat exchanger pumps. Tyrens AB
    - Third party reviewer for gas turbine heat exchanger vibration. Equinor AS
    - Expert in compensation claim for piping vibration from aeroacoustic excitation. Aibel AS
    - Brikquette press, vibration countermeasure. Moelven List AB.
    - Diesel transfer pump - frame design. Delta-P pumper og kompressorsystemer AS.
    - Site noise and vibration mapping, AMEX Foster Wheeler Oy.
    - Site survey, Nanolab, Lund University
    - Site survey, MC2, Chalmers.
    - Method for structural health identification for metal casing protecting concrete structure from cavitation in hydropower units. Sydkraft Hydropower AB.
    - Experimental Modal Analysis of mirrors for solar thermal energy device. Cleanergy AB-
    - Analysis of electro charger. Chargenode Europe AB.
- Research projects
    - Floating offshore wind power, Damping design for increased fatigue life. Innovation Norge.
    - Train noise structure-borne noise transmission in rock. Ensucon AB and Chalmers for Trafikverket.

Software Experience

1. SimLab, user since revisions 5.1 to 7
2. MSC.Patran, experienced user since 1996
3. MSC.Nastran, experienced user since 1996
4. ABAQUS, user 1990-1995
5. FEMAP, occasional user since 1996
6. LMS OPTIMUS, experienced user since 1997
7. LMS Gateway, LMS Link, LMS PreTest, experienced user since 1996. Have held three courses on model correlation and quality assurance.
8. LMS SYSNOISE, experienced user since 1990. Have held five courses on SYSNOISE application.
9. LMS SEADS, experienced user since 1999
10. AutoSEA, experienced user since 1990 (world's 1st AutoSEA user). Have held two courses on SEA.
11. Matlab, [Octave, SciLab, etc], experienced user since 1989
12. DADS, occasional user since 1999
13. LMS FALANCS, occasional user since 1999
14. LMS Test.Lab, occasional user since 2005
15. LMS Cada-X, occasional user since 1996
16. Code Aster FE code, experienced user since 2007
17. Salome, Pre/Post, , experienced user since 2007.
18. AcqMat_1432, measurement software, experienced user since 2007
19. NI Sound & Vibration Measurement Suite, experienced user since 2007.
20. ModalView, measurement analysis and visualization software, experienced user since 2007
21. SpectraPro, software for Condition Monitoring, e.g. Route definition and data analysis, experienced user since 2005.
22. Python, since 2019
23. Kivy, KivyMD for GUI creation on windows, OsX, Android, iOS or Raspberry Pi, since 2019.
24. NI-DaqMx Python, since 2019.
25. pyNastran, occasional user.
26. Odoo ERP system
27. Redmine - for keeping track of ISO 9001.
28. LEIHS - for measurement equipment
29. FortNox. book keeping.

Certificates

- OLF basic course with Helicopter Underwater Escape Training (HUET)
- Saftey and Security training for Oskarshamn, Ringhals, Barsebäck, and Forsmark plants.
- SSG Entre
- ISO 9001:2008, ISO 9001:2015
- Various courses required for on-track work and in tunnels.

Courses

- High-speed Image Based Experimental Modal Analysis & Open Source Tools, 4-day course for PhDs and research students on-site at University of Ljubljana. 2019. (New course in link).