Dr Hessam Alavi

PhD in Engineering Acoustics
Contols and Monitoring Systems Engineer

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Profile

Control Systems engineer with BEng (Hons) and PhD from University of Southampton, Institute of Sound and Vibration Research with more than 10 years of experience in a variety of different industries including consumer electronics, automotive, aviation. With a practical and hands-on approach to my work and research, I am a highly experienced MATLAB, Simulink and COMSOL Multiphysics user. Worked extensively with a variety of 2D and 3D miniature microphones from Microflown Technologies to perform advanced measurement in anechoic and reverberation chambers and listening room condition on a series of miniature drive units used in 3D surround audio soundbars. I am experienced working with Visual DSP++, SHARC Processors, binaural recording and measurement using a variety of different dummy heads and knowledgeable about psychoacoustic and perceptual audio.

SKILLS

- **Software:** COMSOL Multiphysics, MATLAB, Simulink, PLC, SCADA, HMI, DOORS, PTC Integrity, sysML.
- **Hardware:** LMS - Test Lab, 3D Scanning Laser Vibrometry, HEAD Acoustics - ArtemiS, Audio Precision, Brüel & Kjær - Pulse, Listen Inc Sound Check, Adobe Audition CC.
- **Methodologies:** Root cause analysis, Digital Spectral Analysis, Diagnostics, Agile Development.
- **Specific:** Automotive Electrification, Automotive SPICE, PCDS, RMDV, Prototyping.
- **Network:** Electronic Interfaces, CAN, FlexRay, A^2B, Network tool: CANalyser, ECU tool: Corvus.
- **Graphical:** Visualization Mockup, 3D Experience iPLM, SolidWorks, Auto-CAD, Pro-Desktop, Photoshop.
- **Programming:** Visual DSP++ Analog Devices, SHARC Processors Analog Devices.
- **General:** Report writing and Presentation, Microsoft Office, Project, Visio, LaTeX, WinEdt, JabRef.
- **OS:** Windows, Linux.
- **Linguistic Skills:** English (Fluent), Persian (Native).

RESEARCH/WORK EXPERIENCES

Mar 2019 - Nov 2019 **Controls and Monitoring Systems Engineer at Rolls-Royce Plc**

Responsible for performing controls and monitoring systems engineering at the sub-systems level on a variety of projects. Worked with E-Fan X team, hybrid-electric flight demonstrator project, working in collaboration with the airframer Airbus, performing Model-Based Design Engineering. Also worked with Trent-XWB team responsible for upgrading the EEC with the next generation of Visium Core architecture for GR6 program model, for 84K and 97K variants. Working in collaboration with the airframer Airbus on the specific requirements of the new hardware and software architecture using the PTC Integrity and DOORS software for the requirements capture and system design to maintain functional-level system equivalency between the current and upgraded engines.

Skills:

1. Used MATLAB and **Simulink**.
2. Used **PTC Integrity**.
3. Used **DOORS**.

May 2017 - Feb 2019 **Specialist Systems Engineer (NVH & Audio) at Jaguar Land Rover**

Responsible for systems strategy and design on Pre-PS stage, delivering class-leading NVH and infotainment systems for all Jaguar Land Rover vehicles by collaborating with NVH, Audio, CAE and Research teams on a variety of issues such as body structural stiffness, body squeak and rattle, road noise and wind noise.

Vehicle Testing and Analysis Skills:

1. Advanced **LMS - Test Lab** user: Structural Acquisition, Impact Testing and Structural Modal Analysis.
2. Advanced user of **3D Scanning Laser Vibrometer** (Polytec PSV-500-3D).
3. Advanced **MATLAB** user: Programming, Object Oriented Programming, Signal Processing, Audio System Toolbox, Statistical Methods, Machine Learning, Data Analytics, Simulation as a Design Tool.
4. Advanced **Simulink** user for Model-Based Design.
5. Worked with **Head Acoustics**: ArtemiS Suite, Acqua, labCORE, SQuadriga.
6. Worked with **Brüel & Kjær**, Pulse, Automotive Sound Quality.
7. Carried out **subjective** and **objective** measurements track testing and VSAC.

Professional Training Completed at Jaguar Land Rover:

- Product Creation Delivery System (**PCDS**),
- Requirements Management & Design Verification (**RMDV**),
- **H**ybrid **E**lectric **V**ehicle Safety Awareness (**HEV003**),
- **Electronic Interfaces**, Automotive Electronics: **Resistors** and **Capacitors**, **Diodes** and **Transistors**, **Bipolar Transistors** and **Operational Amplifiers**, **Inductors**, **Electromagnetism** and **Resonant Circuits**, **Boolean Logic Gates**, and Using **LT Spice**,
- Flat **Batteries** and **Microcontrollers**,
- GRADE **Microstrain** Measurements (Level 3),

Professional Driver Training Completed:

- Jaguar Land Rover Driver Training **Level 2**, **Advance** Driver Training **Level 3**,
- Proving Ground Driver Training: Introduction, **Level 1**, **Level 3**.

Sep 2009 - Feb 2016 **Lead Product Developer | Research Engineer at OPSODIS Ltd**

OPSODIS is an audio research and manufacturing company developing 3D-audio soundbars and new auralization technology. (http://www.sherwoodusa.com/product/list.asp?subNum=6)

1. As a lead acoustic engineer, I was in charge of a team of 4 acoustic engineers.
2. In charge of measurements and testing of new products and prototypes using a variety of advanced measurements technique in anechoic and reverberant chambers and listening room. Specifically, measurement techniques with dummy head (binaural acoustic transducers).
3. Collaborated extensively with the different international companies and suppliers throughout the full cycle of product development.
4. Understanding the organisation goals, and ability to perform and deliver under pressure and stay competitive in narrow time frames.
5. Work and research individually and in a group.

Sep 2009 - Jan 2016 **Research Scientist at Institute of Sound and Vibration Research**

ISVR – University of Southampton – Southampton – UK.
Research topic: Acoustics of High-Performance Transmission-Line Loudspeakers.
Project manager, responsible for creating and evaluating engineering methods capable of accurately modelling the sound propagation inside a range of acoustically treated waveguides.

1. Designed the 3D geometries of a variety of acoustically-lined, folded ducts using SolidWorks package which were then imported into COMSOL Multiphysics package to numerically characterise the behaviour of sound propagation through acoustically treated waveguides. The COMSOL results were transferred into MATLAB for further analysis and comparison with the results of analytical models and in-situ measurements.
2. Performed DC-flow tests and impedance-tube measurements to experimentally characterise the acoustic properties such as flow-resistivity and tortuosity of a variety of sound absorbing materials which were also modelled numerically using COMSOL package.
3. Conducted in-situ sound field mapping using a variety of transducers and measurement techniques developed by Microflown Technologies, (acoustic sensors: PU-Match, PU-Mini, PU-Regular and USP-Regular), on a range of lined ducts, to evaluate the developed numerical predictions and analytical models.
4. Optimised novel transmission-line loudspeaker designs using the evaluated numerical models to achieve high-performance audio quality.

Sep 2009 - Dec 2012 **Postgraduate Teaching Assistant**

Faculty of Engineering and Environment – University of Southampton – Southampton – UK.
Responsible for conducting workshops and demonstrating laboratories for subjects such as: Mechanics, Electronics, Fluid Dynamics and Mathematics.

Sep 2009 - Dec 2012 **Coordinator of Virtual Acoustics and Audio Engineering Group**

ISVR – University of Southampton – Southampton – UK.
In charge of coordinating the VA&AE and liaising with the main UK acoustic research departments ranging Universities of Southampton, Salford, Queen Mary of London, York and Surrey to arrange an acoustic research hub sharing and collaborating on projects and giving presentations and visits.

Sep 2009 - Dec 2013 **Postgraduate Representative of Fluid Dynamics & Acoustics Group**

ISVR – University of Southampton – Southampton – UK.

EDUCATION

2009-2016 Doctor of Philosophy in Sound and Vibration (PhD)
ISVR, University of Southampton, UK. (Complete thesis can be downloaded at: http://eprints.soton.ac.uk/388041/)

2005-2009 Bachelor in Acoustical Engineering BEng (Hons)
ISVR, University of Southampton, UK. (Presented paper can be downloaded at: http://eprints.soton.ac.uk/79101/)

2004-2005 Foundation year in Engineering
University of Southampton, UK.

ADVANCED COURSES

2009-2019 **Intensive MATLAB Training:**
MATLAB Fundamentals, Programming, Object Oriented Programming, Signal Processing, Audio System Toolbox, Statistical Methods, Machine Learning, Data Analytics, Simulation as a Design Tool.
MathWorks – UK.

Dec 2018 **Simulink for Automotive Design** (Model-Based Design).
MathWorks – UK.

Jan 2012 **Intensive COMSOL Multiphysics Training**
COMSOL – Cambridge – UK.

2008-2009 Advanced course in: **Noise and Vibration**, **Structural Dynamics**, **Active Control of Sound and Vibration**, **Adaptive Methods**, **Random Signals**
ISVR – University of Southampton – Southampton – UK.

PROFESSIONAL AFFILIATIONS AND COLLABORATION

- Corporate Member of Institute of Acoustics (MIOA), Acoustical Society of America (MASA) and Audio Engineering Society (MAES)………......………………………...……………...…..……...……..………...………...**2008-Present**
- Active Member of Audio Engineering Society Standards Committee…………...…..........................…..…**2015-Present**
- Technical Committee member of Audio Engineering Society for Automotive Audio, Loudspeakers and Headphones, Acoustics and Sound Reinforcement, Spatial Audio...**2015-Present**

OTHER QUALIFICATIONS

- Qualified as an international swimming referee,
- Qualified as a swimming coach (Programming and Monitoring) level 3,
- Qualified as a lifeguard (NPLQ) and active member of ASA and RLSS.

ACTIVITIES AND INTERESTS

- Games Maker volunteer at the London 2012 Olympic and Paralympic Games, worked as a lifeguard, as a member of the aquatic team collaborating with four disciplines swimming, diving, water polo and synchronized swimming………………………………………………………………………………………...**Summer 2012**
- Opening Ceremony performer volunteer, at the London 2012 Olympic Games…......................................**27 July 2012**
- Worked as a swimming coach for the Iranian national swimming federation. Responsible for developing training programs for the state swimming team. Training, monitoring and mentoring of teams and individual swimmers at national level………......…....……………………………………………………………......……..……......**1998-2001**
- Organised a national charity championship as a member of the executive committee, which benefited children with cancer and disabilities (Iran, Mashad)…………..**September-2001**
- Sports: Martial arts, Swimming, Horse riding, Tennis, Basketball.