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About

Mohammad has published over 30 research papers in scientific journals and conferences in the fields of Finite Element Analysis of Tyre, Dynamics & Control, Artificial Intelligence and its application in vehicular systems.

Qualifications

- MSc in Mechanical Engineering, Iran University of Science and Technology, 2007
- BSc in Mechanical Engineering, K.N.T. University of Technology, 2005

Biography

Mohammad Behroozi graduated from K.N.Toosi University of Technology with a BSc in Mechanical Engineering in 2001. His final year project was on Automatic Diagnostic of Heart Disease. Then he pursued his study in MSc at Iran University of Science and Technology and finished Master of Science with honour degree in 2008. During his MSc, he worked on Navigation, Motion Planning, and Control of Automated Vehicles in undefined environment with introducing new way of navigation.

He joined the University of Birmingham as a PhD research student in the school of Mechanical Engineering for 3 years from February 2009. His main research area is on aircraft tyre analysis and characterisation. He is now working as a research fellow at the School of Mechanical Engineering, University of Birmingham, on Eco Revolution R – Low Carbon Emission Variable Rolling Resistance Wheel.

Teaching

Demonstrating on

- Vehicle engineering
- Applied Mechanics
- Statics and Dynamics
- Computing for engineers
- Laboratory demonstrator

Research

Research themes

Research activity in post-doctoral program

Eco Revolution R – Low Carbon Emission Variable Rolling Resistance Wheel

This project is about an investigation on the feasibility of the new generation of tyres that use a special mechanism to vary the rolling resistance of tyre based on the situations that vehicle encounters. As a part of this study, the detailed design of the tyre and the way that mechanism works are investigated. Finite element analysis will be the main tool for this analysis. A computer modelling and simulation is required to demonstrate the feasibility of having a self-inflating mechanism. A combination of mechanical simulation and finite element analysis technique will be used to model the self-inflating mechanism and its interaction with the tyre. Then the vehicle tyre under mechanism deployment will be operating under different conditions to the vehicle normal design and its impact is considered on a vehicle's ride and handling through the suspension.

Research activity in doctoral program

Finite Element Analysis of Aircraft Tyres

Mr Mohammad Behroozi worked on finite element analysis of aircraft tyre by Abaqus. This work was supported by AWM (Advantage West Midlands) and MAA (Midlands Aerospace Alliances) under the Aerospace Technology Exploitation Programme (ATEP) with collaboration of Airbus and Dunlop Aircraft Tyre Ltd as beneficiary parties.

Several FE models from 2-D to 3-D were developed to investigate on tyre behaviour in high load and inflation pressure. Then the accuracy of results obtained from the FE models was validated by different types of analysis such as burst simulation, footprint analysis, and sizing check. The scope of this work for the beneficiary side was to assure the tyre designer of reliability of FE tools and employ certified virtual modelling into their new designs so that the development costs and resources will be extremely reduced. Also the aircraft manoeuvres and generated forces were simulated although not enough resources are available for its validity. The main goal was to integrate CAD/FE tools in a user friendly package called TAIS (Tyre Analysis Interface System) so that a wide range of inexpert users in FE concepts can employ it for their future developments.

Research activity

- Finite Element Analysis
- Tyre Dynamics and Structure Analysis

- Vehicle Dynamics
- Fault Diagnosis & Isolation
- Artificial Intelligence and Soft Computing (Fuzzy, Neural Networks and etc.)
- Robotics and Mechatronics
- System Modelling, Analysis, and Identification
- Methods of Advanced Control

Publications

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3. M. Behroozi, O. A. Olatunbosun, “Simulation of Dynamic Characteristics of Aircraft Tires”, Tire Technology Conference, February 2011, Cologne, Germany.
4. M. Behroozi, O. A. Olatunbosun, “FE Analysis of Aircraft Tire”, Tire Technology Conference, February 2010, Cologne, Germany.
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8. M. Behroozi, M. Soltani, Application of vortex tubes in press-shop salon of Iran-Khodro Company, 2005, Vol. 17, Journal of Air Conditioning and Refrigeration.
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12. E. Samadani, M. Behroozi, A. H. Shamekhi, GA-based Optimization of DI diesel engine emission and performance using a neural network model, IEEE SICE2008 Conference, August 2008.
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16. Ghaffari, M. Behroozi, Hami Golbayai, Fault Diagnostics of ECG Signals Using Neural Network and Wavelet Transform, ISME2006, 14th Annual (International) Conference of Iranian Society of Mechanical Engineering, Isfahan, Iran.
17. K. Aalipour, M. Behroozi, S. H. Sadati, A New Motion Planning Algorithm Applied to Differentially-Driven Mobile Robots, ISME2007, 15th Annual (International) Conference of Iranian Society of Mechanical Engineering, Tehran, Iran.
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