Dr. Shravan Vudumu, Ph.D.

Technical Manager, Controls Engineering, Data Analytics
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Summary

Technical Manager with a doctorate degree in Mechanical Engineering and master's degree in Management. Over thirteen years of work experience in a multinational Fortune 500 corporation developing controls algorithms and combustion engines, engineering data analysis, simulations and resolving technical challenges. Broad experience in global technical coaching and management. Currently pursuing a master's degree in Data Analytics part-time.

Education

Georgia Institute of Technology, USA
Master of Science in Data Analytics *Aug 2023 - Present*
- Specialization: Business Data Analytics, Machine Learning

University of Illinois, Urbana - Champaign, USA **GPA: 4.0/4.0**
Master of Science in Management *Aug 2022 - July 2023*
- Specialization: Business Data Management and Communication

Missouri University of Science and Technology, USA **GPA: 4.0/4.0**
Ph.D. Mechanical Engineering *Aug 2006 - July 2010*
- Dissertation title: "Experimental and Computational Investigations of Hydrogen Safety, Dispersion and Combustion for Transportation Applications"

Indian Institute of Technology - Madras, India **GPA: 8.0/10.0**
M.Tech Energy Technology and B.Tech Mechanical Engineering *Aug 2001 - May 2006*
- Thesis title: "Modeling of a Diesel Engine for Speed Control". Minor: Industrial Engineering

Work Experience

Cummins Inc., Columbus, Indiana, USA Aug 2010 - Present
- Controls, Software and Electronics Engineering - Technical Manager
- Dynamic Systems and Controls (DS&C) - Technical Manager
- Dynamic Systems and Controls (DS&C) - Technical Advisor

Management and Technical Coaching Experience
- Managed a team of engineers, group leads and contractors to successfully deliver Cummins' Controls Performance and Features deliverables for multiple diesel and spark ignition engine programs for on-highway and off-highway applications with wide range of engine displacement sizes and air handling architecture complexities.
- Supervised multiple engine development programs by managing deadlines and prioritizing tasks. Handled technical challenges by identifying root cause and following the robust seven-step problem solving process. Guided the team by coordinating with stakeholders.
- Coached and developed local Brazil and China DS&C calibration and validation engineering resources that was needed to maintain Cummins' technology leadership in critical international markets. Built communication bridges with global engineering teams (China, India, UK, and Brazil). This included on-site support at East Asia Research and Development Center in China and at Cummins-Dongfeng joint venture research facilities.
- Aided in the development and restructuring of Cummins' technical documents and engineering practices to ensure wider global use and to integrate into the engine development process.
- Worked with human resources, recruiters, university professors and consultancy firms to address resources gaps by hiring new employees (technical contributors and group leads), interns and contractors as needed and avoided delays on key Cummins' DS&C deliverables.
- Co-ordinated Simulation Based Product Development and next generation engine architecture evaluation efforts in Cummins' East Asia Research and Development Center in China. Provided technical support to define scope, review model capability and to resolve technical issues.
- Led the development of Cummins' AUTOSAR air handling controller by understanding stakeholder voices, developing requirements, being liaison for cross functional engineering tasks, analyzing results and by participating in the delivery of the embedded software and its testing.
- Knowledge and experience in Effective Leadership, Project Management, Managerial Accounting and Finance.

Technical Contributions and Experience

- Designed improvements and completed calibration of model-based air handling controller for multiple Cummins engines to achieve higher fuel economy, optimal transient performance, and reduced emissions in various driving conditions. Supported cross functional development work.
- In-depth experience in collecting required data from test cells and prototype trucks, analyzing data for performance and on-board diagnostics analysis, and presenting results to stake holders.
- Developed MATLAB tools to analyze data from trucks, test cells and engine emission cycles to present key findings to the customers and stakeholders.
- Thorough experience in development and calibration of model-based air handling controller, virtual sensors, and diagnostics algorithms for different engine architectures.
- Extensive experience in engine simulations to develop new controller design concepts for various new air handling architectures using GT-POWER engine simulation software and Simulink tools.
- Comprehensive engineering analysis experience of intake air system, EGR system, heat exchangers, turbomachinery, combustion, and emissions of Cummins' engines.
- Experience in various Cummins' air handling software component designs, embedded software regression testing, building prototype ECM builds and open-loop/closed-loop bench testing.
- Developed a new model-based on-board diagnostic (OBD) algorithm for the air handling subsystem to detect failed parts on low-cost engine platforms (a six-sigma project).
- Developed a model-based turbocharger protection design to prevent engines from failure (a six-sigma project).
- Created technical requirements by collaborating with cross functional teams.

Research Experience

- Characterized the fluid dynamics of new/alternative transportation fuels to ensure their safe and proper use. **Research was funded by US Department of Transportation** (through Research and Innovative Technology Administration's National University Transportation Center) and the **Department of Defense' Defense Logistics Agency** (through Air Force Research Laboratory).
- **Played a key role in setting-up Missouri's first hydrogen fueling station** together with operating a hydrogen powered commuter bus to develop, demonstrate, and evaluate safe use of hydrogen-based technologies.
- Performed research on internal combustion engines powered by alternative and conventional fuels to characterize their unique performance, combustion, and emissions characteristics.
- **GM PACE** (General Motors - Partners for the Advancement of Collaborative Engineering Education) sponsored project for the integration of simulations into engineering curriculum.
- **Developed mathematical diesel engine models** for optimization of engine controllers.
- Developed a critical data acquisition system to acquire real time engine data for model validations.

Publications

- As doctoral researcher, **published six international journal and conference papers** (IJHE, ASME, Energy)
- Technical documents to guide Cummins' global engineers. Published research documents for US DOT's repository

Software Skills

- **Data Analytics Software**: R, Python, Power BI, Tableau, SQL, Git and version control, Excel
- **Data Analytics Skills**: Data cleansing, modeling, statistical analysis, interpretation, optimization, visualization
- **Engineering Software**: MATLAB & Simulink, GT-POWER, Data Acquisition tools, Minitab

Data Analytics Projects

- Data Analysis of Divvy Bikes, a ride sharing system in Chicago | *Python*
- Machine Learning Algorithms for Credit Applications | *R programming*

Certifications, Honors and Achievements

- Selected in **"Outstanding Under 35 Young Scientists Committee"** at "HySyDays 2007, Second World Congress of Young Scientists on Hydrogen Energy" organized by the Inter-University Research Center for Sustainable Development, Sapienza University of Rome, Italy.
- Recipient of the prestigious US Department of Transportation's (Research and Innovative Technology Administration) **National University Transportation Center (NUTC) assistantship.**
- Reviewed more than 30 peer-reviewed research papers for publications in international journals.
- Merit scholarship and tuition waiver (2001-06). Member of ASME, SAE, AIAA, IJHE (2009-10).
- Received **Six Sigma Green Belt** certification (July 2015).
- Completed **Systems Engineering Certification** sponsored by Cummins and University of Detroit-Mercy.
- Recipient of Cummins' **Business Impact Award for leadership and contributions from Vice President.**