C. MICHAEL GIBSON

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EDUCATION

M.S., Mechanical Engineering, Concentration: IC Engines, Mississippi State University, 2019.
B.S., Mechanical Engineering, Mississippi State University, 2007.
A.A., Engineering, Jones County Junior College, 2005.

PROFESSIONAL INTEREST

People development – helping the next generation become prepared to enter the workforce; safety; operations management; internal combustion engines; vehicle efficiency; combustion optimization with alternative and traditional fuels; engine optimization for integration with exhaust aftertreatment catalysts; military readiness.

WORK EXPERIENCE

Research Engineer Feb 2018 – Current

Center for Advanced Vehicular Systems (CAVS), Mississippi State University, Starkville, MS

Dynamometer facility manager – plan and coordinate vehicle and engine testing activities; conduct facility and equipment upgrades and maintenance; support automotive related engineering classes; hire and manage students and engineers to operate facility and complete projects.

Center leadership activities – provide support and leadership for operations activities of research center; founding member of Center's Safety Committee; support and advise strategies of development and use of Center's Proving Ground; advise on selection of test and support vehicles and support the maintenance and conversion to research needs; develop and support efficiency improvement projects; provide both leadership and support for implementation of Industrial Engineering principles of 5S and Continuous Improvement.

Funded Research – support various funded research projects by helping develop models for simulation activities; researching topics to increase team knowledge and decision-making capabilities; transportation of research materials between locations; assisting in physical testing as needed for projects.

Athlete Engineering – review projects with potential research partners; provide Mechanical Engineering advice to team; manage team of students and engineers to design, fabricate, test and deploy custom mascot vehicles for MSU Athletics.

EcoCAR Advisor – review competition challenges with students; transport research vehicles to various activities; review deliverable documents and presentations; travel with students to competitions and testing activities to help ensure success, support on-site testing.

Development Engineer – Air Systems: Turbochargers Aug 2015 – Jan 2018

John Deere Power Systems, Waterloo, IA

Manage turbo programs to deliver the right turbocharger for engine design and development teams that meet Performance, Up-time, Cost, and Schedule goals on new and existing engine programs through: program scoping, technology selection, hardware definition, supplier

selection, engine integration, verification, and product implementation; understand turbocharger capabilities and limitations to ensure reliable implementation; generate requirements from internal/external customer needs; develop relationships, understand capabilities, and further develop capabilities with suppliers; enhance existing internal tools and develop new tools to enable better turbocharger development; review and improve processes for documentation and communication to improve knowledge base and reduce re-work.

Performance & Emissions Calibration & Development Engineer Apr 2012 – Aug 2015

John Deere Power Systems, Waterloo, IA

Responsible for testing and selection of low-power injectors for large engines to meet durability requirements and emissions regulations, and subsequent development and calibration activities; ran tests and conducted analysis of engine cylinder head and piston temperatures to improve durability; evaluated performance and emission impact of combustion system change to improve thermal piston durability; utilized modeling software to predict and analyze off-ambient engine operation; helped manage engine software changes and releases; led all experimental activities for new engine program including turbo-machinery testing and selection, fuel system testing and calibration, and combustion development and testing; manage prototype engine builds including parts procurement, giving design guidelines, and directing assembly-floor mechanics; provide support to Continuous Improvement, Customer Support, and Field Performance groups with diagnosis and analysis of engine issues.

Graduate Research Assistant Jan 2008 – Mar 2012

Department of Mechanical Engineering, Mississippi State University, Starkville, MS

Manage engine lab; prepare lab for experimentation; instrument engines for experimental purposes; determine needs, then specify and order supplies and instruments; develop systems to supply and measure air and fuel flows; design and fabricate any items needed that cannot be purchased; install, commission, maintain, and operate emissions testing equipment; maintain and repair engines (including multiple complete engine teardowns of VW 1.9L TDi); perform dual-fuel experiments with various liquid and gaseous fuels; lead all experiments; review data collected from experiments to conduct performance, emission, and detailed combustion analyses; update lab for future experiments; lead transition to new facility. Responsibilities pertaining to the new facility included assisting in design and layout of building; leading smooth transition of research equipment; installation and commissioning of new dynamometers in facility; installation and commissioning of new Single-Cylinder Research Engine; reinstallation of VW TDi: provide consultation for installation and commissioning of heavy-duty diesel engine; and determining how to arrange equipment and supplies in new facility to best accommodate current and future research needs safely.

Engineering Trainee Dec 2005 – Jul 2007

Pac-Mac, division of Hol-Mac Corporation, Bay Springs, MS

Worked during school breaks; gained hands-on knowledge of products by working in assembly; led expansion project of overhead conveyor; team member on 3 Kaizen events including being on the first Hol-Mac Kaizen team to work a double Kaizen event; member of 4-man team tasked with designing and building a new assembly line; assisted in design and fabrication of racks, tables, etc. for new assembly line; designed and built new material handling devices that increased productivity and safety; worked with assembly to set new

record for trucks built per week; assisted manufacturing engineer on checking and modifying of tooling and fixtures; began installation and upgrade of overhead cranes; implemented Statistical Process Control database at the plant and trained management and employees on its use.

Assistant to Editor Apr 2002 – May 2005

The News-Commercial, Collins, MS

Maintained computer network; managed subscription/mailing software; suggested equipment purchases; organized digital filing system; assisted in layout of newspaper; designed advertisements; typed submitted articles; wrote obituaries; sorted and mailed newspapers; trained incoming employees; repaired office lighting; refurbished newspaper sales racks; and performed other repair jobs.

PROFESSIONAL TRAINING

- Systems Engineering Fundamentals – California Institue of Technology
- Creating and Using Knowledge Briefs – Target Convergence Corporation
- Diesel Performance, Combustion & Emissions – University of Wisconsin
- Society of Automotive Engineers:
    - Selective Catalytic Reduction for Diesel Engines
    - Diesel Engine Technology
    - Advanced Diesel Particulate Filtration Systems
- Design of Experiments & Model-Based Calibration - MathWorks
- Automotive Functional Safety and the ISO 26262 Standard – kVA
- Process Failure Modes Effects and Analysis – CAVS Extension
- Industrial Safety Training – MS Automotive Manufacturers Association
- First Aid and CPR
- Surviving Bombing Incidents for Educators (trauma training) - New Mexico Tech
- Mississippi State University Trainings:
    - Export Controls and Refresher
    - Information Security
    - Building Manager Training
    - Hot Work
    - Hazardous Material and Laboratory Safety
    - Advanced Composites Institute Composites Production

OTHER SKILLS/EXPERIENCE

Software experience with SolidWorks; PTC Creo; MathCad; Matlab; ANSYS; National Instruments' LabVIEW and DIAdem; GT Suite; Microsoft Office; QuarkXPress; Interlink Circulation; Windows and Mac Operating Systems; Adobe Acrobat; Adobe Photoshop; AutoCad; AutoCad Architecture.

Specialized in integration of sensors, control hardware, status monitors, and other upgrades to vehicles and systems in general. Experienced with metal fabrication and general shop tools as well as general construction experience. Experienced with wheeled and tracked equipment including operation, maintenance, and minor repairs. Learned to perform many other tasks growing up on a farm.

PERSONAL INTERESTS

Participated in numerous local, national, and international aid trips, including medical/dental and construction. On these trips I have had many responsibilities from working in a pharmacy to setting up and running crowd control. Also assisted team leader with logistical work in the areas of supplies, international shipping, and general team management.

Volunteer coach for archery/shotgun withing MSU Extension Service 4-H Shooting Sports. Owned and operated small lawn service companies at different times. Avid fisher and hunter. Amateur mechanic, handling all my personal automotive repairs, modifications, and restoration.

HONORS AND ACTIVITIES

2019 recipient of the Bagley College of Engineering Research Award for Staff. Participant in peer review process of journal and conference articles for ASME and SAE. President's list at Mississippi State University and Jones County Junior College. Graduated high school as Valedictorian and Star Student.

ADVISED STUDENTS

Vance F. Hudson (2022). Full-Angle Computed Tomography (CT) of Gasoline Spray.
Oussama Oussi (2022). Literature Review of Ducted Fuel Injection (DFI).
Malak Y. Zeriouh (2021). Ducted Fuel Injection (DFI).

PROFESSIONAL SOCIETY MEMBERSHIPS

American Society of Mechanical Engineers
International Committee for Proving Ground Safety
Society of Automotive Engineers
Southeastern Team Reducing the Impacts of Diesel Emissions (STRIDE) Collaborative

PUBLICATIONS

Journal Articles

1. A.C. Polk, C.M. Gibson, N.T. Shoemaker, K.K. Srinivasan, and S.R. Krishnan. "Detailed Characterization of Diesel-Ignited Propane and Methane Dual Fuel Combustion in a Turbocharged DI Diesel Engine." Proc. IMeche, Part D: J. Automobile Engineering, 227(9), 1255-1272, (doi:10.177/0954407013487292).
2. A.C. Polk, C.M. Gibson, N.T. Shoemaker, K.K. Srinivasan, and S.R. Krishnan. "Analysis of Ignition Behavior in a Dual Fuel Turbocharged Direct Injection Engine Using Propane and Methane as Primary Fuels." Trans. ASME: Journal of Energy Resources Technology, 135(3), 032202, (10 pages), (doi:10.1115/1.4023482).
3. C.M. Gibson, A.C. Polk, N.T. Shoemaker, K.K. Srinivasan, and S.R. Krishnan. "Comparison of Propane and Methane Performance and Emissions in a Turbocharged Direct Injection Dual Fuel Engine." Transactions of ASME: Journal of Engineering for Gas Turbines and Power, 133 (9), Article GTP-092806. (DOI:10.1115/1.4002895).
4. N.T. Shoemaker, C.M. Gibson, A.C. Polk, S.R. Krishnan, and K.K. Srinivasan. "Performance and Emissions Characteristics of Bio-diesel (B100)-ignited Methane and Propane Combustion in a Four Cylinder Turbocharged Compression Ignition Engine." Accepted for publication in Journal of Engineering for Gas Turbines and Power, Article GTP-11-1347.

Peer-Reviewed Conference Papers

1. B Jelinek, G. Henley, A. Card, T. Hannis, C.M. Gibson, J. Priddy, S. Boyle, M. Figueroa-Santos, J. Mange. (2024). Vehicle-Level Control Systems Framework for Use in Create-GV Vehicle Dynamics SImulations. *GVSETS 2024 conference proceedings*. Novi, Michigan.
2. B. Jelinek, J.E. Salmon, G.L. Mason, C.M. Gibson, T. Hannis, N. Pachel, W. Jarrell, and B. Towne. (2021). Simulation Study of Light-Weighting Effects on Ride Quality and Mobility. *GVSETS 2021*. Novi, Michigan.
3. A.C. Polk, C.M. Gibson, N.T. Shoemaker, K.K. Srinivasan, and S.R. Krishnan. "Analysis of Ignition Delay Behavior in a Turbocharged Direct Injection Dual Fuel Engine using Propane and Methane as Primary Fuels," Paper No. ICEF 2011-60080, Proceedings of the ASME IC Engines Division 2011 Fall Technical Conference (ICEF2011), October 2-5, Morgantown, WV.
4. N.T. Shoemaker, C.M. Gibson, A.C. Polk, S.R. Krishnan, and K.K. Srinivasan, "Performance and Emissions Characteristics of Bio-diesel (B100)-ignited Methane and Propane Combustion in a Four Cylinder Turbocharged Compression Ignition Engine." Paper No. ICEF 2011-60081, Proceedings of the ASME IC Engines Division 2011 Fall Technical Conference (ICEF2011), October 2-5, Morgantown, WV. ---*presenter, **nominated for best paper
5. C.M. Gibson, A.C. Polk, N.T. Shoemaker, K.K. Srinivasan, and S.R. Krishnan, 2010. "Comparison of Propane and Methane Performance and Emissions in a Turbocharged Direct Injection Dual Fuel Engine." Paper No. ICEF2010-35128, Proceedings of the ASME IC Engines Division 2010 Fall Technical Conference (ICEF2010), September 12-15, San Antonio, TX. ---* presenter
6. G.A. Adebiyi, K.K. Srinivasan, and C.M. Gibson, 2008. "Thermodynamic Performance Optimization of Reciprocating Internal Combustion (IC) Engines." Paper No. IMECE2008-66026, Proceedings of the ASME International ME Congress and Exposition 2008, November 2-6, Boston, MA. --- *presenter

Posters

1. C.M. Gibson, A.C. Polk, N.T. Shoemaker, K.K. Srinivasan, S.R. Krishnan, 2011. Analysis of Performance and Emissions of E85 and Diesel Dual Fueling in a Turbocharged Direct Injection Compression Ignition Engine. MSU Biofuels Conference, October 6, 2011, Mississippi State University.
2. A.C. Polk, C.M. Gibson, N.T. Shoemaker, S.R. Krishnan, K.K. Srinivasan, 2011. Analysis of Ignition Behavior in a Turbocharged Direct Injection Dual Fuel Engine using Propane and Methane as Primary Fuels. MSU Biofuels Conference, October 6, 2011, Mississippi State University.
3. G.A. Adebiyi, K.K. Srinivasan, and C.M. Gibson, 2008. Thermodynamic Performance Optimization of Reciprocating Internal Combustion (IC) Engines. 1st Energy Workshop, April 17, 2008, Mississippi State University.
4. C.M. Gibson, K.K. Srinivasan, and Z. Rowland, 2008. Performance Evaluation of Propane Injection for Diesel Engines. 1st Energy Workshop, April 17, 2008, Mississippi State University.