

# JESSICA B. ZHAAN

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## MECHANICAL ENGINEER

*Innovation and Design • Concept to Prototype • Testing and Validation*

Highly analytical, performance-driven engineering professional with 10+ years' experience creating innovative, cost-efficient designs. Expertise in applied research, new concept development, simulation, and validation. Broad knowledge in alternative fuels industry including repeated success developing prototypes that improve marketability for previously unfeasible technologies. Superior problem-solving and time-management abilities. Team spirited with effective communication and presentation skills. Proficient with AutoCAD, Mathcad, LabVIEW, MATLAB, Mathematica, MSC: ADAMS, CarSim, SolidWorks, Microsoft Project, and MS Office.

### Research & Design Strengths

- Design, Analysis, and Validation
- Project / Qualification Planning
- Manufacturing Requirements / Specifications
- Finite Element Analysis (FEA)
- On- and Off-line Test Development
- Statistical / Process Analysis
- ISO and Safety compliance
- Finite Element Method (FEM)

## PROFESSIONAL EXPERIENCE

FRACZAL, INC., Toledo, Ohio

2005 – Present

### **Mechanical Design Engineer**

*Collaborate with product developers and engineers to develop and operationalize state-of-the-art alternative power plant concepts for automotive applications.*

Research and review existing technologies based upon target markets; apply design analysis, FEA process, and non-linear engineering concepts to create plans. Coordinate with suppliers / vendors and internal engineering resources to obtain prototype parts and equipment; define functional, dimensional, and visual requirements for components. Evaluate and demonstrate manufacturing feasibility and technical justification for design approach; conduct design validation. Maintain comprehensive documentation of complex design activities.

- Doubled life of liquid hydrogen in vehicle-mounted tanks in collaboration with Chemical Engineers during design of hydrogen re-uptake and sublimation reclamation system.
- Conceived, designed, and prototyped a light-weight infinitely variable transmission (IVT) for use with hydrogen fuel cell engines, resulting in 6% improvement in fuel efficiency.
- Played integral role in patent-pending electric motorcycle concept combining miniaturized IVT with regenerative braking.
- Developed low-weight, low-friction piston assembly for air-pressure vehicle (air car), increasing top speed of prototype by 11% with no decrease in range.

GAD TRANSMISSIONS, Detroit, Michigan

2001 – 2004

### **Mechanical Engineer**

*Researched and designed new auxillary equipment to ensure ongoing industry advantage for a CVT / IVT transmission manufacturer.*

Developed new tooling concepts and techniques to maximize production effectiveness. Conducted build-versus-buy analysis for new equipment. Teamed with senior engineers to prototype equipment;

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