Diego A. Arias

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Objective

Research and development position in a major internal combustion engine manufacturing company in the areas of thermodynamics, fluid dynamics and combustion. Interested in the development and application of computational fluid dynamics, thermal system modeling and artificial neural networks.

Education

PhD Mechanical Engineering Expected 8/20XX
University of Wisconsin-Madison

- Advisor: Dr. Timothy A. Shedd
- Thesis: "Numerical modeling of air and fuel flow in carburetors for small engines"
- GPA: 3.9/4.0 *(Optional for PhD candidates)*

M.S. Mechanical Engineering 9/20XX
Universidad de los Andes Bogotá, Colombia

- Research Project: "Development of a methodology to evaluate the mechanical and environmental performance of vehicles under on-road type tests"
- GPA: 4.7/5.0 (Top student in class) Graduated with Honors

B.S. Mechanical Engineering 3/20XX
Universidad de los Andes Bogotá, Colombia

- GPA: 4.1/5.0 (Top 10% of class)

Employment Experience

Research Assistant University of Wisconsin-Madison 9/20XX-present
Multiphase Flow Visualization and Analysis Laboratory—Engine Research Center

- Developed numerical model of carburetors for small utility engines, incorporating: dynamic effects, two-phase flow, compressible flow and losses across metering orifices.
- Implemented carburetor model in one-dimensional engine simulation software to study the effect of carburetor elements on power and emissions.
- Studied single-phase flow through complex geometries inside carburetors with numerical simulations in a commercial CFD package.
- Designed and built experimental setups to characterize single-phase and two-phase flow in carburetor parts, as well as to validate numerical simulations.
- Supervised three undergraduate research assistants.

Short Projects Funded By Industry

Argonne National Laboratory 20XX

- *Heat recovery from an internal combustion engine for a hybrid vehicle.* Determined technical feasibility of an ammonia-water cycle in a heat recovery system from an internal combustion engine.

Ingenium-Project Development 20XX

- *Feasibility of numerical simulations of surface-piercing propellers.*
- Results indicated the CFD models required for the complete simulation of the interaction between the rotating propeller and the water free-surface.

Water Consultants International 20XX

- *Numerical simulation of a spray drying application.* Results of analysis used for the design of an industrial prototype of a spray drying system for brine treatment.

- **All margins: between ¾″ and 1″.**
- **Font style: Times New Roman.**
- **Font size: 10-12 pt.**

Employment Experience *(continued)*

Research Assistant, Universidad de los Andes, Bogotá, Colombia 10/20XX – 7/20XX
Energy Conversion Research Group – Department of Mechanical Engineering

- Compared typical fuels found in Bogotá, based on analytical combustion calculations for adiabatic flame temperature and NOx emissions.
- Conducted an energy audit to minimize the cost of electric energy consumption in the Aqueduct of town Facatativá.
- Reviewed international experiences of running CNG- and diesel-fueled transit buses and generated recommendations for the successful implementation of CNG in Bogotá's mass transport system.

Teacher, Universidad de los Andes, Bogotá, Colombia 8/20XX – 5/20XX

- Lectured 'Technical Drawing' for two groups of 30 students, 3 hours/week (2 semesters)
- Supervised two graders.

Intern Engineer, General Motors, Bogotá, Colombia 7/20XX – 1/20XX

- Supplied technical assistance to Commercial and Engineering Departments.
- Conducted market research for new vehicles.

Computer Skills

Thermo-fluid simulations with Fluent 6 and Gambit: Definition of geometry and flow cases by running scripts in Unix environment
Advanced knowledge of EES
Intermediate knowledge of GT-Power 6, with implementation of user defined functions.
Code writing in C and Fortran
Experience in neural networks implemented in Matlab
Experience in ChemkinII, Stanjan, Gaseq, Matlab, KivaLite and SolidEdge

Laboratory and Instrumentation Skills

Labview and data acquisition systems
Implementation of unsteady compressible internal flows
Implementation of unsteady boundary conditions with user defined functions
Combustion gas analyzers
MOUDY impactor and Total Suspended Particle samplers
DMA electrostatic particle classifier
Condensation particle samplers
Inductively Coupled Plasma Optical Emission Spectroscope

Languages

Spanish (native speaker)
French and Italian (reading proficiency)

Professional Societies

American Society of Mechanical Engineers
Society of Automotive Engineers

Awards and Honors

Best Paper Award—SAE Small Engine Technology Conference, Graz, Austria 20XX
Graduated with Honors—Universidad de los Andes, Bogotá, Colombia 20XX
Young Researchers Scholarship—COLCIENCIAS Colombian NSF, Bogotá, Colombia 20XX

Interests

Photography, theatre, windsurfing

Publications

Arias, D. A., and Shedd, T. A., 20XX, Steady and dynamic models of fuel and air flow in carburetors for small engines. *ASME Journal of Fluids Engineering. (*Accepted for publication)

Arias, D. A., Mueller, S., and Shedd, T. A., 2004, Numerical study of fuel flow through small orifices. IMECE2004-60886. *ASME International Congress*, Anaheim, CA.

Arias, D. A., and Shedd, T. A., 20XX, Numerical and experimental study of fuel and air flow in carburetors for small engines. *SAE 2004-32-0053. Small Engines Technology Conference*, Graz-Austria. (Best Paper Award)

Presentations

Arias, D. A., and Shedd, T. A., 20XX, Numerical analysis of air and fuel flow in small engines carburetors. *Third Biannual ERC Symposium: Low Emission Combustion Technologies for Future IC Engines*, University of Wisconsin-Madison.

Arias, D. A., and Shedd, T. A., 20XX, Numerical study of air flow in carburetor venturi. *11th International Symposium of Flow Visualization*. University of Notre Dame.

Huertas, J., and **Arias, D. A**., 20XX, Dynamic tests of CNG- and diesel-fueled buses at high altitude. *Proceedings of World NGV2002 8th International and 20th National Conference on NGVs*. Washington D.C.

Huertas, J., and **Arias, D. A.**, 20XX, Analysis of international tests of CNG fueled buses, and forecast of its performance in Bogotá (in Spanish). *Revista Gas Vehicular*. Bogotá: Vol. 2, No. 9.

Huertas, J. and **Arias, D. A.**, 20XX, NOx emissions in CNG fueled vehicles (in Spanish). *Revista Gas Vehicular*. Bogotá: Vol. 2, No. 6.

Publications and presentations:
If you have a long list, you may provide a separate Publications & Presentations page.

References

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ECS TIPS

Never print back-to-back!

- **E-mail as a PDF attachment to employers and to ecs@engr.wisc.edu. Engineering Career Services will attach 2- to 3-page resumés to the Datasheets of MS and PhD students.**
- **May need to develop a text version without tabs, indents, bullets or bold face for electronic scanning on employer website and databases.**