Exponent®
Engineering & Scientific Consulting

# Daniel Canuto, Ph.D., P.E.

Engineer | Mechanical Engineering
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## Professional Profile

Dr. Canuto specializes in mechanical engineering with an emphasis on fluid flows and heat transfer. He has expertise in the analysis of systems for heating, ventilation, and air-conditioning (HVAC), industrial refrigeration, turbomachinery, wastewater processing, and residential plumbing. He addresses clients' needs by using both experimental and model-based approaches to engineering problems.

Dr. Canuto also has experience in evaluating product safety, both for consumer products and industrial applications. He has analyzed machine guarding in varied settings, including box folders, bottling equipment, and wood processing equipment. Additionally, he has assessed consumer products for compliance with industry standards and state/federal regulations to support litigation matters involving children's toys and playground equipment.

Prior to joining Exponent, Dr. Canuto completed his doctoral studies at UCLA. In his research, he conducted interdisciplinary collaborations with physicians to develop a framework for integrating patient data into cardiovascular simulations.

Before graduate school, Dr. Canuto was a National Science Foundation Research Experience for Undergraduates (NSF REU) Fellow at Florida State University (FSU). While there, he used computational fluid dynamics (CFD) software to simulate compressible flow in the Martian atmosphere, and employed commercial finite-element analysis (FEA) software to test suspension designs for the Society of Automotive Engineering's student Baja competition.

## Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of California, Los Angeles (UCLA), 2019

M.S., Aerospace Engineering, University of California, Los Angeles (UCLA), 2015

B.S., Mechanical Engineering, Florida State University, 2014

Outstanding Master's Degree Award, UCLA, 2015

National Science Foundation Research Experience for Undergraduates Fellowship, 2013

## Licenses and Certifications

Licensed Professional Mechanical Engineer, California, #40404

40-Hour HAZWOPER (Hazardous Waste Operations and Emergency Response) Certificate #38897

Certified Forklift Operator

## Prior Experience

Graduate Student Researcher, UCLA, 2014-2019

Research Assistant, FSU AME Center, 2013-2014

Manufacturing Engineering Intern, GE Aviation Systems, 2012

## Professional Affiliations

American Society of Mechanical Engineers (ASME)

American Physical Society (APS)

## Publications

Canuto D, Taira K. Two-dimensional compressible viscous flow around a circular cylinder. Journal of Fluid Mechanics 2015; 785:349-371.

Canuto D, Chong K, Bowles C, Dutson EP, Eldredge JD, Benharash P. A regulated multiscale closed-loop cardiovascular model, with applications to hemorrhage and hypertension. International Journal of Biomedical Engineering 2018; 34: https://doi.org/10.1002/cnm.2975.

**Presentations**

Canuto D, Chang Y, Eldredge JD, Dutson EP, Benharash P. A parameter ensemble Kalman filter for patient-specific cardiovascular modeling. Presentation, 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA, 2018.

Canuto D, Chong K, Bowles C, Dutson EP, Eldredge JD, Benharash P. A multiscale closed-loop cardiovascular model, with applications to hemorrhage and hypertension. Presentation, 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, 2017.

Canuto D, Eldredge JD, Zenit R. Numerical investigation of the C-Start in an elastic plate. Presentation, 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA, 2015.

Canuto D, Jantzen R, Taira K. 3D printing of unsteady vortex dynamics. Poster presentation, 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA, 2013.

## Project Experience

**Heating, Ventilation and Air Conditioning (HVAC)/Plumbing**

Analyzed allegations of deficient HVAC cooling capacity and hot water supply for a high-rise condominium, including evaluation of HVAC load models and investigation of air/water temperature measurements.

Investigated root cause of water leakage in a variable air volume (VAV) system. Assessed design and reviewed operational data for closed-loop water heating coils.

Analyzed K-12 school campus HVAC design and performance data for compliance with municipal codes

and industry standards on ventilation.

Assessed cause of improperly located piping in a hotel building by analyzing engineering drawings and construction schedules.

Conducted leak testing and inspection of numerous residential plumbing components, such as angle stops, PEX tubing, steel braided hose, and pressure-balancing shower valves.

Reviewed building automation system (BAS) data and performed analytical modeling of the leak rate for a steam pipe rupture.

**Process Piping and Industrial Refrigeration**

Assessed probability of contaminant buildup in a boric acid wastewater processing plant. Analyzed plant design and evaluated operational/maintenance procedures.

Analyzed design and construction of an industrial ammonia refrigeration system for commercial ice production.

**Turbomachinery**

Assessed braking systems on failed wind turbine generators, including inspection of failed parts and modeling of brake torque under rated power generation conditions.

Inspected failed natural gas generator stators to determine root cause of overheating.

**Machine Design and Guarding**

Analyzed design loads, lifting capacities, and operational information for a hydraulic jacking system that failed during highway construction.

Evaluated design and operation of a safety light curtain system used to guard wood processing machinery.

Investigated dislodging of a dock leveler's maintenance safety mechanism through analytical load modeling.

Analyzed forces needed to open/close a spring-assisted roof hatch, including CAD modeling of the hatch to determine the magnitude of spring assistance.

Assessed design of a safety laser scanner used to guard cardboard processing equipment.

Investigated engine hoists available to customers at an automotive junkyard, including evaluation of hoist capacity and instructions provided by staff.

**Consumer Products**

Investigated root cause of a failure of a spinning child's toy, including modeling of typical loads and design/fabrication of a test fixture for rotational failure testing.

Tested a lawnmower for potential to start a brush fire through sparks emitted due to impact of its blades on landscaping rocks.

Assessed the stability of an artificial privacy hedge under wind loading through laboratory experiments and analytical modeling.

Evaluated children's scooters' kickstand designs for stability and safety in the event of a fall.

Assessed design and construction of a children's swing set for compliance with safety standards and state regulations.

Instrumented SUVs with video recording devices to study ergonomics of rear seatbelt usage under varying passenger and child safety seat configurations.