

# METODI ZLATINOV

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**Summary:** A mechanical engineer with a passion for scientific inquiry and for creating things that are both useful and elegant. I hold B.S.E and M.S. degrees from Princeton and MIT respectively, and have 8 years of professional experience with a focus on fluid, thermal and machine design. My technical skills include CAD, CFD, FEA, scientific programming, machine design (including requirements definition, DFM and FMEA) and hands-on machining/prototyping.

## EDUCATION

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### Massachusetts Institute of Technology, Cambridge, MA

09/2009 – 06/2011

SM in Aeronautics and Astronautics (2011)

Cumulative GPA: 3.88/4.0

Thesis: Secondary Air Interaction with Main Flow in Axial Turbines

### Princeton University, Princeton, NJ

09/2005 – 06/2009

BSE in Mechanical and Aerospace Engineering (2009), Minor in Materials Science and Engineering (2009)

*Summa cum laude*, Cumulative GPA: 3.86/4.0

Thesis: Testing of a Micro-Scale Gas Turbine for Power Generation

### Beijing World Youth Academy, Beijing, China

09/2002 – 07/2005

International Baccalaureate Diploma (2005)

## SKILLS

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<b>CAD/CAE</b>	Siemens Nx, NX Nastran, ANSYS Fluent/CFX/Mechanical, Pro/ENGINEER,
<b>Programming</b>	Matlab, Python, Shell Scripts, Excel VBA, Mathcad, C/C++, Java, Perl
<b>Machining</b>	CNC Manufacturing, Turning, Milling, TIG/MIG Welding, Soldering, Woodworking
<b>Design Codes</b>	ASME Boiler and Pressure Vessel Code, ASME B31.1, ASME PTC-18, USBR Design of Small Dams
<b>Languages</b>	English (fluent), Chinese/Mandarin (fluent), Bulgarian (fluent), Spanish (intermediate)
<b>Leadership</b>	Lean Six Sigma, Project management, GE Crotonville Foundations of Leadership training

## PROFESSIONAL EXPERIENCE

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### Senior Mechanical Engineer, Natel Energy

02/2017 – 09/2018

- **Responsibilities:** Work with a multidisciplinary team of engineers to develop a novel hydraulic turbine, enabling cost-effective production of clean energy from low head resources, while benefiting the health of watershed ecosystems and the communities that surround them. Responsibilities include conceptual and detailed design of the turbine, managing the technical specification for the product, scale model testing, off-the-shelf component selection (e.g. gear units, motors, couplings, actuators, bearings, etc.), class III cost estimation of balance of plant construction.
- **Achievements:** Developed the technical requirements and product specification that drove all engineering and commercial activities. Improved turbine hydraulic efficiency by 4%. Designed a fish fish-friendly impulse turbine bucket that is manufacturable from composite SMC. Designed a composite nozzle to meet stringent flow and structural requirements. Developed scaling laws for applying scale model test results to larger units. Led a team of subcontractors and collaborators to develop novel hydroelectric plant designs that are projected to deliver 20-40% cost savings over historical baselines. Co-wrote and presented successful bid to DOE for \$1.9M DOE grant.

### Lead Engineer, GE Aviation

08/2013 – 02/2017

- **Responsibilities:** Push the boundaries of state-of-the-art Computational Fluid Dynamics (URANS and LES) to develop advanced technologies for cooling gas turbine components, improve cycle efficiency and increasing durability for the next generation of aircraft engines. Mentor colleagues and lead a team or to identify and pursue new research and design opportunities.
- **Achievements:** Spearheaded the successful development of an industry-leading process for shape optimization, using automated high fidelity CFD, design of experiment, statistical metamodeling and a genetic algorithm. This achievement has positioned our team to harness advances in computational power in an unprecedented way, representing a potential game-changing advantage over our competitors. The process has already produced tangible results, including a novel turbine blade cooling feature for which I share a patent, as well as accelerated design cycles and a reduced testing costs.

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**PROFESSIONAL EXPERIENCE (continued)**


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**Mechanical Engineer, Altran****06/2011 – 07/2013**

- **Responsibilities:** Structural analysis of power plant piping and pressure vessels, in accordance with the ASME codes. Failure analysis of nuclear power plant components. Screening and analysis for Flow Accelerated Corrosion (FAC) in power plants, based on operating conditions, plant layout, non-destructive inspection, and industry experience.
- **Achievements:** Fast, on-the-job learning, achieving a high level of proficiency in water hammer analysis, seismic analysis, and valve component level evaluations in accordance with ASME codes. Develop an automated tool (using Excel VBA) for processing large data sets of structural support data, accelerating design iterations significantly.

**Graduate Researcher, MIT Gas Turbine Laboratory****09/2009 – 05/2011**

- **Responsibilities:** Leverage CFD to investigate aerodynamic loss mechanisms in an axial gas turbines.
- **Achievements:** Produced two journal papers, one of which was awarded a Best Paper Award by the International Gas Turbine Institute. Identified three distinct mechanisms for generating loss due to secondary coolant flows. Discovered a new mechanism for hot gas ingestion into turbine rim cavities, and developed a physical model for it.

**Designer/Machinist, Princeton University****06/2008 – 06/2009**

- **Responsibilities:** Design, build and test a 100kW micro gas turbine, as part of an independent thesis.
- **Achievements:** Redesigned and machined a centrifugal compressor, created a clutch system, and re-balanced rotor. Installed diagnostic equipment, and integrated with custom signal amplification circuitry and LabVIEW data acquisition system. Conducted component and full-scale engine tests, demonstrating shaft-speeds of over 8000 RPM.

**Experimental Research Assistant, Princeton University Fluid Dynamics Laboratory****07/2007 – 09/2007**

- **Responsibilities:** Investigate secondary flow structures downstream of a 90° pipe bend at high Reynolds numbers, using Particle Image Velocimetry (PIV).
- **Achievements:** Within a 3-month period, designed and installed a new test section for the experiment, completed rig shakedown, collected and analyzed first sets of PIV data.

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**PUBLICATIONS AND PRESENTATIONS**


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- Zlatinov, M. B., C. S. Tan, D. Little, and M. Montgomery. "Effect of Purge Flow Swirl on Hot-Gas Ingestion into Turbine Rim Cavities", *Journal of Propulsion and Power*, Vol. 32, No. 5 (2016), pp. 1055-1066.
- Zlatinov, Metodi, and Greg Laskowski. "Hybrid Large-Eddy Simulation Optimization of a Fundamental Turbine Blade Turbulated Cooling Passage." *AIAA Journal of Propulsion and Power* (2015): 1-6.
- Hellström, Leo HO, Metodi B. Zlatinov, Guangjun Cao, and Alexander J. Smits. "Turbulent pipe flow downstream of a bend." *Journal of Fluid Mechanics* 735 (2013): R7
- Zlatinov, M. B., C. S. Tan, M. Montgomery, T. Islam, M. Harris, "Turbine Hub and Shroud Sealing Flow Loss Mechanisms", *ASME Journal of Turbomachinery*, 134, 061027 (2012), DOI:10.1115/1.4006294
- White Papers, published by EPRI, Palo Alto, CA, 2012
  - "Journal Bearings in Turbine and Generator Systems: Principles, Design and Operation"
  - "Stress Corrosion Cracking in Steam Systems: Characteristics, Susceptibility, and Prevention"
  - "Water Induction in Steam Turbines for Power Generation: Understanding and Preventing Water Damage"
  - "Nondestructive Evaluation Methods: With Applications to Boilers and Steam Turbines"

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**AWARDS AND HONORS**


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- Rookie of the Year, GE Aviation, 2014
- Best Paper Award, International Gas turbine Institute, presented at ASME Turbo Expo 2012
- Sigma Xi Engineering Research Honors Society, Princeton University 2009
- Donald Janssen Dike Award for Excellence in Undergraduate Research, Princeton University 2009
- Phi Beta Kappa, Princeton University 2009

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**PERSONAL INFORMATION**


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Lived in Beijing, China for 13 years. Enjoy spending time with family outdoors, woodworking, carving, building model airplanes from scratch, knitting, hiking, playing guitar, skiing, cooking, and audiobooks.