Mayank Chetan
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WORK EXPERIENCE

National Renewable Energy Laboratory (NREL) Flatirons Campus, Boulder, CO
Researcher - Mechanical Engineering *Apr 2022 - Present*

- **Aero-elastic Modeling**: Developed an aero-elastic model of a prototype wind tribune to support experimental validation for a highly instrumented field campaign. The developed turbine model was used to determine resonance conditions for stability field experiments.
- **Hurricane Resilient Turbines**: Analyzed the effect of hurricane-like wind conditions on the structural loads of offshore wind turbines. The analysis includes understanding the affects of using a battery/power backup for turbine yaw systems.
- **Scaled Offshore Turbines**: Developed a series of up-scaled offshore wind turbines to improve turbine CapEx and AEP estimates for the Gulf of Mexico. The study was limited to jacket-type sub-structures.
- **Tool Development**: Contributed to the development of WISDEM, WEIS, OpenFAST, and ROSCO.

The University of Texas at Dallas Richardson, TX
Research Assistant (Advised by Dr. D. Todd Griffith) *Aug 2017 - Apr 2022*

- **Blade Structure Design (13.2-50 MW)**: Designed large wind turbine blades for the SUMR (Segmented Ultralight Morphing Rotor) project funded by ARPA-e.
- **Active Aerodynamic Control**: Designed and optimized a series of 3.4MW, 10MW, and 15MW turbine models including baseline controllers and detailed blade structures using active aerodynamic controls (funded by ARPA-e under the OPEN 2018 program).
- **Aero-elastic Instability**: Demonstrated feasibility of reducing blade mass for large wind turbines while mitigating flutter for both two- and three-bladed rotor systems.
- **Tool Development**: Developed a design tool for large wind turbine blade structure research using MATLAB and a custom MATLAB-Simulink based environment to parallelize OpenFAST loads analysis.
- **Digital Twin of a wind turbine blade**: Developed a novel multi-fidelity digital twin model to enable a better field-testing campaign. This method was successfully implemented on a 21-meter 1/5th scale wind turbine blade.
- **Publications**: 13 journal publications, 9 conference papers & 3 articles in preparation.

Sahyadri Edu Dreamers R&D Pvt Ltd Mangalore, India
Design Engineer *Jul 2016 - Jul 2017*

- **Dream Kit**: Designed an electronic prototyping platform aimed at elementary school children. Also collaborated with Industrial design partners for a manufacturability study on mass production.
- **Administration**: Assisted in developing the company policies to conform to Government of India regulations on startups.

Honda Motorcycle and Scooter India Pvt Ltd Bangalore, India
Engineer E2 *Jul 2014 - Jul 2016*

- **Warranty Analysis**: Streamlined analysis and countermeasure implementation procedures to minimize warranty claims leading to a 33% reduction in engine-related warranty claims.
- **Continuous Variable Transmission**: Spearheaded a cross-functional team to enhance Continuous Variable Transmission for 'Honda Activa'. India's largest selling two-wheeler vehicle, which led to a 60% reduction in pre-delivery warranty claims.
- **Global Honda Quality Standards(GHQS)**: Defined and authored the Standard Operating Procedures for the newly established department of Market Quality and Engineering based on GHQS, a derivative of ISO 9001:2008.

EDUCATION

The University of Texas at Dallas Richardson, TX
PhD in Mechanical Engineering; GPA: 3.86/4.0 *Aug. 2017 – Dec. 2021*

- **Dissertation Title**: Design of Large Wind Turbine Rotors Through Passive and Active Load Mitigation Strategies
- **Research Adviser**: Dr. D Todd Griffith

RV College of Engineering Bangalore, India
Bachelor of Engineering in Mechanical Engineering; GPA: 8.64/10.0 *Sep. 2010 – May. 2014*

- **Capacitive Micro-machined Ultrasonic Transducer**: Designed and simulated a CMUT device with a Polyvinylidene fluoride member using COMSOL Multiphysics.
- **Laser Drilling**: Simulated the heat-affected zone caused by laser drilling of reinforced carbon fiber composite with Nd-YAG laser using COMSOL Multiphysics.

Technical Skills

- **Wind Turbine Design Tools**: OpenFAST, WEIS, WISDEM, ROSCO, MLife, NuMAD, BECAS, Simulink.
- **Software Tools**: ANSYS, Solidworks, Eagle CAD, UniGraphics NX.
- **Languages**: Python, Fortran, MATLAB, LaTeX.
- **Others**: Linux, GIT, Docker, Continuous Integration (CI), Server deployment, Raspberry Pi, Slurm.

Journal Publications

1. Stephen B Johnson, **Mayank Chetan**, D Todd Griffith, James A Sherwood. "A design-driven wind blade manufacturing model to identify opportunities to reduce wind blade costs," *Wind Energy*, 2023.

2. Sepideh Kianbakht, Dana Martin, Kathryn Johnson, Daniel Zalkind, Lucy Pao, Eric Loth, Juliet Simpson, Shulong Yao, **Mayank Chetan**, D Todd Griffith. "Design space exploration and decision-making for a segmented ultralight morphing 50-MW wind turbine," *Wind Energy*, 2022. DOI: 10.1002/we.2781

3. Alejandra S. Escalera Mendoza, Shulong Yao, **Mayank Chetan** and D. Todd Griffith. "Design and analysis of a segmented blade for a 50MW wind turbine rotor," *Wind Engineering*, 2022. DOI: 10.1177/0309524X211069393

4. Stephen B Johnson, **Mayank Chetan**, D Todd Griffith, James A Sherwood. "Development of high-fidelity design-driven wind blade manufacturing process models to investigate labor predictions in wind blade manufacture," *Wind Energy*, 2022. DOI: 10.1002/we.2731

5. **Mayank Chetan**, Shulong Yao, D. Todd Griffith. "Flutter behavior of highly flexible blades for two- and three-bladed wind turbines," *Wind Energy Science*, 2022. DOI: 10.5194/wes-7-1731-2022

6. **Mayank Chetan**, Mohammad S. Sakib, D. Todd Griffith, Abhineet Gupta, Mario A Rotea. "Design of a 3.4MW Wind Turbine with Integrated Plasma Actuator-based Load Control," *Wind Energy*, 2021. DOI: 10.1002/we.2684

7. Shulong Yao, **Mayank Chetan**, D. Todd Griffith, Alejandra S.Escalera Mendoza, Michael S. Selig, Dana Martin, Sepideh Kianbakht, Kathryn Johnson, Eric Loth. "Aero-Structural Design and Optimization of 50 MW Wind Turbine with over 250-meter Blades," *Wind Engineering*, 2021. DOI: 10.1177/0309524X211027355

8. Abhineet Gupta, Mario A Rotea, **Mayank Chetan**, Mohammad S. Sakib, D. Todd Griffith. "A Methodology for Robust Load Reduction in Wind Turbine Blades Using Flow Control Devices," *Energies*, 2021.

9. **Mayank Chetan**, Shulong Yao, D. Todd Griffith. "Multi-fidelity Digital Twin Model for a Sub-scale Downwind Wind Turbine Rotor," *Wind Energy*, 2021. DOI: 10.1002/we.2636

10. Lucy Y. Pao, Daniel S. Zalkind, D. Todd Griffith, **Mayank Chetan**, Michael S. Selig, Gavin K. Ananda, Christopher J. Bay, Tyler Stehly, Eric Loth, "Control Co-Design of 13 MW Downwind Two-Bladed Rotors to Achieve 25% Reduction in Levelized Cost of Wind Energy," *Annual Reviews in Control*, 2021. DOI: 10.1016/j.arcontrol.2021.02.001

11. Shulong Yao, **Mayank Chetan**, D. Todd Griffith. "Structural Design and Optimization of a Series of 13.2 MW Downwind Rotors," *Wind Engineering*, 2021. DOI: 10.1177/0309524X20984164

12. Meghan Kaminski, Carlos Noyes, Eric Loth, D. Rick Damiani, Scott Hughes, Christopher Bay, **Mayank Chetan**, D. Todd Griffith, Kathryn Johnson, Dana Martin. "Gravo-Aeroelastic Scaling of a 13-MW Downwind Rotor for 20% Scale Blades," *Wind Energy*, 2020. DOI: 10.1002/we.2569

13. Shulong Yao, D. Todd Griffith, **Mayank Chetan**., Christopher J. Bay, Rick Damiani, Meghan Kaminski, and Eric Loth. "A gravo-aeroelastically scaled wind turbine rotor at field-prototype scale with strict structural requirements," *Renewable Energy*, Vol. 156, 2020, pp.535-547. DOI: 10.1016/j.renene.2020.03.157

14. Daniel Zalkind, Gavin K. Ananda, **Mayank Chetan**, Dana Martin, Christopher J. Bay, Kathryn Johnson, Eric Loth, D. Todd Griffith, Michael S. Selig, and Lucy Pao. "System-level design studies for large rotors," *Wind Energy Science*, Vol. 4, 2019, pp.595-618. DOI: 10.5194/wes-4-595-2019

15. D. Todd Griffith and **Mayank Chetan**, "Assessment of flutter prediction and trends in the design of large-scale wind turbine rotor blades," *Journal of Physics: Conference Series,* Vol. 1037, No. 4, 2018, pp. 042008.

Conference Papers

1. Eric Loth, Gavin Ananda, **Mayank Chetan**, Rick Damiani, D. Todd Griffith, Kathryn Johnson, Sepideh Kianbakht, et, al, "Field tests of a highly flexible downwind ultralight rotor to mimic a 13-MW turbine rotor," *TORQUE 2022,* 2022, Delft, Netherlands.

2. Abhineet Gupta, Mario A. Rotea, **Mayank Chetan**, M. Sadman Sakib and D. Todd Griffith, "Effect of wind turbine size on load reduction with active flow control," *TORQUE 2022,* 2022, Delft, Netherlands.

3. Alejandra S. Escalera Mendoza, **Mayank Chetan** and D. Todd Griffith, "Quantification of Extreme-Scale Wind Turbine Performance Parameters due to Variations in Beam Properties," *AIAA SciTech 2021 Forum,* 2021, Virtual Event. DOI:10.2514/6.2021-1603

4. Mohammad S. Sakib, **Mayank Chetan** and D. Todd Griffith, "Aero-Structural Design Optimization of a 3.4 MW Wind Turbine Using Plasma Actuator Based Load Control," *AIAA Aviation 2020 Forum,* 2020, Virtual Event.

5. **Mayank Chetan**, Mohammad S. Sakib and D. Todd Griffith, "Aero-Structural Design Study of Extreme-Scale Segmented Ultralight Morphing Rotor Blades," *AIAA Aviation 2019 Forum,* 2019, Dallas, Texas. DOI: 10.2514/6.2019-3347

6. **Mayank Chetan**, D. Todd Griffith, and Shulong Yao, "Flutter Predictions in the Design of Extreme-Scale Segmented Ultralight Morphing Rotor Blades," *AIAA SciTech 2019 Forum,* 2019, San Diego, California. DOI: 10.2514/6.2019-1298

7. Shulong Yao, D. Todd Griffith, **Mayank Chetan**, Christopher J. Bay, Rick Damiani, Meghan Kaminski, and Eric Loth, "Structural Design of a 1/5th Scale Gravo-Aeroelastically Scaled Wind Turbine Demonstrator Blade for Field Testing," *AIAA SciTech 2019 Forum,* 2019, San Diego, California. DOI: 10.2514/6.2019-1067

8. Christopher J. Bay, Rick Damiani, Lee Jay Fingersh, Scott Hughes, **Mayank Chetan**, Shulong Yao, D. Todd Griffith, Gavin K. Ananda, Michael S. Selig, Daniel Zalkind, Lucy Pao, Dana Martin, Kathryn Johnson, Meghan Kaminski, and Eric Loth, "Design and Testing of a Scaled Demonstrator Turbine at the National Wind Technology Center," *AIAA SciTech 2019 Forum,* 2019, San Diego, California. DOI: 10.2514/6.2019-1068