

# Luke D. Neise

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## EDUCATION

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**Vanderbilt University, Nashville, TN**  
Bachelor of Engineering, Mechanical  
Bachelor of Arts, Classical Civilizations  
GPA: 4.00 / 4.00

**Lafayette High School, St. Louis, MO**  
GPA: 4.646 / 4.00  
Valedictorian or Salutatorian  
(school didn't distinguish between 1<sup>st</sup> and 2<sup>nd</sup> in rank)

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## ENGINEERING WORK AND PROJECT EXPERIENCE

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### **Vanderbilt Aerospace Design Laboratory (VADL)**

**August 2018 – Present**

*NASA Student Launch Initiative – Field Engineer*

- Selected as one of thirteen engineers to be a member of Vanderbilt's prestigious and successful (6x NASA Student Launch Initiative champions) aerospace engineering design team and research laboratory
- Tested and cleared rocket's leg deployment system for impact failure (per VADL standard) by designing, constructing, and executing a physical impact test with an IMU to model force exerted if the rocket were to tip over and fall
- Supported team in the launch of a rocket with self-guiding collaborative UAV payload & autonomous reorientation

### **US Air Force Arnold Engineering Development Complex**

**June 2019 – August 2019**

*PCIP Test Engineer and Test Manager*

- As Test Engineer with 'Secret' security clearance, conducted 4 multi-week DOD-led wind tunnel testing programs
- Streamlined transonic boundary layer trip sizing process by integrating support documents into a user-run MATLAB code
- Personally investigated and chose AGARD Model B size for test program and presented on findings to program leaders
- Analyzed 13 multi-tunnel models for shock reflection, startup transient loading, and tunnel unstart concerns using Excel

### **Essex Industries**

**May 2018 – August 2018**

*Aerospace Engineering Intern*

- Created official prototype for Essex stick grip with SolidWorks and rapid prototyping for iterative design
- Got Essex trigger/switch approved for use by designing LabVIEW program and mechanical test for fatigue failure
- Proved AT-6 platform control did not register natural flight vibration by coordinating with local vibration analysis company to conduct vibration fatigue test with personally designed LabVIEW program
- Improved Essex emergency breathing equipment gas expulsion rate by conducting tests on LiOH CO<sub>2</sub> scrubbing
- Wrote or edited four formal engineering reports that were published for company-wide and customer use

### **Vanderbilt Multiscale Computational Mechanics Laboratory**

**August 2017 – January 2018**

*Research Assistant – Hypersonic Materials Project*

- Only Undergraduate student chosen to work with Professor Oskay on research delivered to & supported by USAF/NASA
- Developed predictive lifespan analysis of complex composite material for aerospace panel in hypersonic conditions
- Adapted MATLAB code for hypersonic pressure and temperature fields into FEA analysis with Abaqus CAE

### **Vanderbilt Robotics Autonomous Mining Robot**

- Designed, machined, & assembled 11 components of conveyor subsystem using bandsaw, 3D printer, and mill
- Created system that successfully stored/transported 15 kg of gravel at NASA RMC without any system failure or jamming

### **Magnus Effect Investigation Machine**

- Quantified/demonstrated Magnus effect on a cylinder by displaying lift and angular displacement at user-controlled rpm
- Machined and assembled components with mill & bandsaw to create damped and nearly frictionless mechanical hub
- Organized, wired, and coded electronic system in Arduino to integrate motor PWM control and 4 sensors into machine

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## TECHNICAL SKILLS

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LabVIEW, SolidWorks, MATLAB, Arduino, CREO, Abaqus (FEA), COMSOL (CFD), Bandsaw, Mill, Soldering, MS Office

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## RELEVANT COURSEWORK

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Aerospace Propulsion, Airplane Aerodynamics, Computational Fluid Dynamics, Heat Transfer, Astrophysics, Systems Dynamics, Thermodynamics, Energetics, Machine Design, Fluid Mechanics, Quantum Physics, Dynamics, Mechanics of Materials, Circuits

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## AWARDS AND HONORS

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Mary J. Weber Scholarship | National Merit Scholarship | ICCS Rome Admittee | 2019 NASA USLI National Champions

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## CAMPUS INVOLVEMENT AND LEADERSHIP

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**Tau Beta Pi Engineering Honor Society – President**

**April 2019 – Present**

**Vanderbilt Special Media Projects – Chief Researcher and Editor**

**January 2017 – May 2017**

**Vanderbilt Dance Marathon – Partnerships Committee Member**

**September 2016 – May 2017**

**Brooking Park and Westview Assisted Living Film Club – Founder and President**

**May 2015 – August 2016**