






# Austin Ebel

---

**homepage:** [austinebel.net](http://austinebel.net)   
**email:** [abe2122@columbia.edu](mailto:abe2122@columbia.edu) 

EDUCATION	Columbia University <i>Bachelors of Science, Electrical Engineering</i> GPA: 3.85/4.00	2015-2020 New York, NY
	College of William and Mary <i>Bachelors of Science, Computer Science</i> GPA: 3.89/4.00	2015-2020 Williamsburg, VA
PUBLIC- ATIONS	<i>Gardner, J., Hunt, K., <b>Ebel, A.</b>, Rose, E., Zylich, S., Jensen, B., Wise, K., Siochi, E., Sauti, G. Machines as Craftsmen: Localized Parameter Setting Optimization for Fused Filament Fabrication 3D Printing. <i>Advanced Materials Technologies</i>, 2019</i>	
RESEARCH EXPERIENCE	VLSI Lab, Columbia University Supervisor: Mingoo Seok	2021
	<ul style="list-style-type: none"><li>• This work will explore hardware architectures for machine learning related to either <i>TinyML</i> or <i>hardware security</i>.</li></ul>	
	Research Assistant, Columbia University Supervisor: Debasis Mitra	2020-2021
	<ul style="list-style-type: none"><li>• Used deep reinforcement learning to more accurately model optimal investments in information security.<ul style="list-style-type: none"><li>– Publication in progress.</li></ul></li></ul>	
RELEVANT PROJECTS	NASA Langley Research Center Supervisors: John Gardner, Godfrey Sauti	2018
	<ul style="list-style-type: none"><li>• Created an end-to-end tool for integrating machine learning into the 3D printing process. Resulting prints show a 14% improvement in quality and a 28% decrease in runtime.<ul style="list-style-type: none"><li>– Published paper.</li></ul></li></ul>	
	<i>Full-Custom 8-Bit Microprocessor Design</i> 	
	<ul style="list-style-type: none"><li>• Designed a fully custom 8-bit microprocessor core in Cadence Virtuoso using IBM's 90nm technology.</li></ul>	
	<i>Parallelization of Particle Swarm Optimization</i> 	
	<ul style="list-style-type: none"><li>• Reduced the runtime complexity of Particle Swarm Optimization from <math>O(n^2)</math> to <math>O(n)</math> by making use of parallel computing techniques on GPUs. Optimal use of shared memory, block size, and data transfer techniques were investigated.</li></ul>	
	<i>Pipelined RISC-V CPU (in progress)</i> 	
	<ul style="list-style-type: none"><li>• Working through Berkeley's <i>EECS151 Introduction to Digital Design and Integrated Circuits</i> FPGA labs and final project.</li></ul>	

<b>ADDITIONAL EXPERIENCE</b>	<i>NASA Jet Propulsion Laboratory</i> Supervisor: Stirling Algermissen <ul style="list-style-type: none"> <li>Expanded the scope of automated testing procedures for use in NASA's upcoming <i>SWOT</i> satellite.</li> </ul>	2020
	<i>NASA Jet Propulsion Laboratory</i> Supervisor: Mike Gangl <ul style="list-style-type: none"> <li>Developed a cloud-based service to help hydrologists query existing and future NASA datasets.</li> </ul>	2019
<b>PRESENT- ATIONS</b>	<i>Columbia University Data Science Institute</i> <i>Poster Session, Data Science Day</i> Attacker-Defender Investment Strategies in Cybersecurity	2021
	<i>Columbia University Data Science Institute</i> <i>Cybersecurity Center Poster Session</i> Attacker-Defender Investment Strategies in Cybersecurity	2021
<b>AWARDS</b>	<i>3<sup>rd</sup> Place (\$150), Columbia Masters Design Expo</i> Parallelization of Particle Swarm Optimization	2019
<b>OTHER</b>	An assortment of other, non-hardware related projects can be found on my website: <code>austinebel.net</code>	
<b>TECHNOLOGY SUMMARY</b>	<i>Programming Languages:</i> Python, MATLAB, C++, Verilog <i>Hardware Tools:</i> Cadence Virtuoso, Calibre, Ultrasim, Xilinx Vivado <i>Others:</i> Unix, Git, L <sup>A</sup> T <sub>E</sub> X	