Christopher Maxwell Woodard

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EDUCATION AND SUMMARY

Northwestern University | Evanston, Illinois   Graduated June 2024
Bachelor's of Science in *Biomedical Engineering* | GPA: **3.82/4.00**
Honors: **QuestBridge Match Scholarship Recipient (Full 4-Year Scholarship), Bellaire Alumni Scholarship Recipient**

Lab automation engineer with industry experience developing novel liquid handler tools and mechatronic systems to support biotech R&D at scale.

SKILLS

Hardware:	SOLIDWORKS/AutoCAD, PCB Design, PLC Automation, Embedded Systems, Signal Processing, Rapid Prototyping
Software:	VENUS, Python, C/C#, Ladder Logic, REST APIs, Smartsheet, Agile Management (JIRA), Integrated Data Apps
Coursework:	Experimental Design, Machine Dynamics, Solid Modeling, Mechatronics, Heat/Mass Transfer, Electronic Design
Interests:	Competitive Hip-Hop Dance, Portrait Photography, Filipino/Black- and Dance-Oriented Community Building

AUTOMATION EXPERIENCE

Moderna Therapeutics, Inc. | *Norwood, Massachusetts*   January 2025 — Present
Applied Technologies Co-Op
- Developed and deployed a novel C# deck loading UI for HAMILTON STAR series that provides contextual labware and safety information to operators, minimizing the risk of instrument collisions and sample loss within Moderna R&D and QC
- Using Smartsheet's REST APIs, collaborated with end-users to integrate a runtime feedback button into HAMILTON's visual software for improved incident tracking, raising the number of reported observations and crashes by 50%
- Programmed and assembled an HMI-PLC module to control an 11-valve bonded manifold for LNP synthesis, reducing instrument form factor by 70% and eliminating failures caused by leaks or clogs from tube connection points

Automation Engineering Co-Op   July 2024 — December 2024
- Automated high-throughput assays using HAMILTON STAR/STARlet liquid handlers for 6 different R&D teams to reduce in-lab scientist benchwork by at least 50% and improve sample processing and throughput by up to 80%
- Developed custom automation solutions to meet assay-specific needs, such as a magnet adapter to enable low-elution volumes for nucleic acid isolation or a Python algorithm to increase plating flexibility and applicability for users
- Integrated HAMILTON vacuum and wash stations into automation workflows to improve sample yield post-filtration by 70% and enable the preparation of delicate RNA-target samples for NMR screens, assisting the discovery of new vaccine platforms

ADDITIONAL TECHNICAL EXPERIENCE

Falk Center for Molecular Therapeutics | *Evanston, Illinois*   September 2023 — June 2024
Electrical and Mechanical R&D Lead
- Designed smart mechatronic system to noninvasively detect depressive states in rats using behavioral data and alert veterinary staff in real-time for intervention, ensuring Falk Center experiments adhere to ethical animal testing
- Prototyped actigraphy sensor subsystem that uses optical flow and infrared to quantify and locate lateral rat motion at 20 samples per second, sending data via SPI to be used in machine learning algorithm for rat depression detection system
- Modeled device housing with SOLIDWORKS and selected materials that address potential failure modes due to rat subjects
- Researched existing form factors and model products to determine specifications and design direction for 9-month project

Hartmann Research Lab | *Evanston, Illinois*   May 2021 — April 2023
Undergraduate Research Assistant
- Identified MetaPolyzyme treatment as optimal lysis method for lung metagenome construction, increasing bacterial DNA yield within bronchoalveolar lavage samples by 33% and enabling for Nanopore long-read sequencing and assembly
- Surveyed wastewater systems in 4 regions of the world for *Helicobacter pylori* using Python and Java metagenomic profiling tools such as FASTQC, MetaPhlAn3, and SPAdes to begin sequencing region-specific antibiotic resistance genes

Briteseed, LLC | *Chicago, Illinois*   June — August 2023
Biomedical R&D Engineering Intern
- Programmed real-time photoplethysmography analysis in smart surgical grasper tool to collect heart rate and perfusion evaluations within 6 seconds of tool operation, enabling surgeons to understand blood flow during minimally invasive surgery
- Collaborated with electrical engineers to replace MATLAB data acquisition GUI with Python, addressing issues with MATLAB packet loss that interfered with experimental testing results and improving GUI motor control capabilities
- Compiled and analyzed 120 spectral datasets of self-dissected *ex vivo* porcine tissues to refine machine learning models utilized by Briteseed's next-generation surgical tools that differentiate tissues via hyperspectral imaging