CLEMENT TOH

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EXECUTIVE BRIEF:
2027 U.S. CO-OP ONBOARDING & ADMINISTRATION

Applicant: Clement Toh
Target Role: Hardware / Mechatronics Engineering Co-Op
Availability Window: January 4th, 2027 – July 30th, 2027

1. The Timeline: 7-Month Co-Op Runway

- **Extended Availability:** Available for a continuous 7-month block (January 4th, 2027 – July 30th, 2027), aligning completely with standard US corporate Spring/Summer Co-Op cycles.
- **Academic Sanction:** This full-time block is an officially approved, credit-bearing Industrial Attachment sanctioned by the National University of Singapore (NUS).

2. The Visa Strategy: Zero Corporate Legal Liability

- **Pre-Vetted Eligibility:** Fully qualified for a J-1 Intern Visa, fully administered and sponsored by a US Department of State-designated 3rd-party organization (Cultural Vistas).
- **Zero HR Legal Burden:** This pathway requires zero corporate immigration attorney involvement, zero internal visa petitions, and zero legal liability for your organization. The designated sponsor manages all federal SEVIS compliance.
- **Tax Advantage:** Under federal regulations, individuals on a J-1 Intern classification are exempt from US FICA taxes (Social Security and Medicare), reducing direct payroll tax overhead.

3. Relocation Readiness & Logistical Autonomy

- **Immediate Mobility:** Possess the verified financial liquidity to independently manage upfront international travel logistics and initial U.S. housing overhead, requiring no immediate corporate relocation cash advances or sign-on stipends to clear before day one.
- **Frictionless Processing:** Prepared to independently drive and fast-track the administration of all consular timelines, embassy scheduling, and mandatory regulatory insurance requirements, ensuring zero administrative delays for your engineering team.

4. Frictionless Manager Onboarding (The "60-Second" Rule)

- **Academic Compliance:** While the university requires a midpoint and a final performance evaluation to award course credit, the administrative burden rests entirely on the student.
- **Pre-Filled Administrative Flow:** All administrative baseline details, technical project descriptions, and university rubrics will be completely pre-filled by me prior to submission.
- **Supervisor Efficiency:** Your engineering supervisor's involvement is strictly limited to reviewing the pre-filled technical metrics and providing a signature, requiring less than 60 seconds of execution time per review cycle.

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EDUCATION

National University of Singapore (NUS) — **Singapore**
- Bachelor of Engineering (Mechanical Engineering) with Honours — Expected May 2028
- Relevant Coursework: Thermodynamics, Circuit Analysis, Additive Manufacturing — GPA: 4.19 / 5.00

Singapore Polytechnic (SP) — April 2023
- Diploma in Mechanical Engineering (with Merit) — GPA: 3.86 / 4.00

TECHNICAL SKILLS

- **Software, Networking & Scripting**: C++, Python (Data Pipelines, Test Automation), EPL (Ethernet POWERLINK) Network Analysis, Platform.io, InfluxDB, Grafana, MATLAB, GitLab
- **Embedded Systems & IIoT**: Arduino, PLCs, NI DAQ (NI-9236), Edge-Computing Telemetry, Sensor Routing
- **Characterization & Integration**: Electro-Mechanical Troubleshooting, Hardware-Software Integration, Precision Kinematics, System-Level Debugging
- **CAD & Architecture**: SolidWorks, Autodesk Inventor, Siemens NX, Fusion 360

PROFESSIONAL EXPERIENCE

JD Union Pte. Ltd. — **Singapore**
Mechatronics Engineering Intern — June 2026 – Present
- Executed rigorous quality control and engineering validation testing (EVT) on Class 4 laser (LUXINAR CO2); utilized microscopy to inspect Quartz Block Head (QBH) fiber optics to prevent window failure.
- Engineered and commissioned a heavy-duty mobile industrial test infrastructure (>250kg capacity) using SolidWorks, bridging the gap between mechanical chassis design and physical hardware integration.
- Integrated sensitive laser control components, including an IPG Ytterbium Fibre Laser and NANIO Air Power Supply, optimizing complex cable routing and thermal dissipation to support vision systems.

Advanced Remanufacturing and Technology Centre (A*STAR) — **Singapore**
Systems Integration & Development Engineering Intern — September 2022 – April 2023
- Programmed Python scripts to execute EPL network packet-sniffing by hardware-tapping the Industrial PC, validating electro-mechanical interactions via synchronized in-situ spectrometer with recoater blade.
- Engineered an embedded firmware architecture using an M5Stack edge-device (C++/Platform.io), querying an InfluxDB database via custom Flux scripts to automate real-time alerts.
- Designed and built hardware-software test setups, safely routing a 12-channel NI DAQ and acoustic emission sensors to characterize process parameters.

Singapore Armed Forces (Armour Simulation Wing) — **Singapore**
Systems Operator (National Service) — May 2023 – May 2025
- Operated and maintained military simulation hardware across a synchronized network of training cabins.
- Collaborated with defense engineering firm to debug hardware-software systems to operation stability.

TECHNICAL PROJECT

3D Printer Thermal & Hardware Optimization (Ender 3 V3 SE) — June 2024
- Engineered a custom print-head shroud (Fusion 360) and integrated high-performance blower fans to optimize laminar airflow, resolving thermal inconsistencies and mitigating part warpage.

LEADERSHIP & COMMUNITY INVOLVEMENT

Boon Lay Youth Network — **Singapore**
Grassroots Leader — May 2021 – April 2023
- Organized and directed online academic support programs for underprivileged students, coordinating 20 volunteer educators and supervising over 20 concurrent breakout tutoring sessions.

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Spring/Summer 2027 Engineering Co-Op Application

Dear US Hardware Engineering Leadership,

Singapore is a world-class hub for localized R&D, but it lacks the massive, high-volume hardware scaling that defines the US tech landscape. I am crossing the globe specifically to embed myself on a high-volume manufacturing floor where teams are building the physical machines that make the machines, at a scale that simply does not exist anywhere else. I am actively seeking a **Mechanical Design, Hardware Validation, or Systems Integration Co-Op position** for a **7-month Co-Op block (January – August 2027)** to bring my background in hardware-software integration to your team.

In modern hardware validation, teams constantly struggle to pull clean, actionable data out of physical tests. My core engineering niche is bridging that exact gap. I specialize in the end-to-end telemetry pipeline: designing the mechanical test fixture in CAD, wiring the physical DAQ instrumentation, and writing the C++ and Python logic to stream that data into real-time analytical dashboards.

During my time at A*STAR, I structurally modified a commercial EOS M 290 metal 3D printer, safely routing 12 signal wires through custom 13 mm ports to an NI DAQ. I built the InfluxDB/Grafana architecture to isolate ~50 µm deviations in powder spreadability. Currently, I am further refining my optomechatronics skills at JD Union, engineering multi-axis motion stages and integrating galvanometer scanners for laser micro-processing systems. I want to bring this exact methodology of combining physical mechanical design with real-time digital telemetry to help scale your hardware validation processes.

I have attached a brief logistics summary detailing my fully sponsored J-1 Visa status (which requires zero HR processing or financial sponsorship from your team) and a visual appendix of my instrumentation work. I would welcome the opportunity to discuss how my background can immediately support your upcoming validation cycles.

Best regards,

Clement Toh
Mechanical Engineering Undergraduate, National University of Singapore
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Visual Appendix

The following exhibits provide concrete visuals of my hands-on execution across both physical mechanical architecture and digital systems integration, demonstrating my ability to bridge complex physical environments with precise data telemetry.

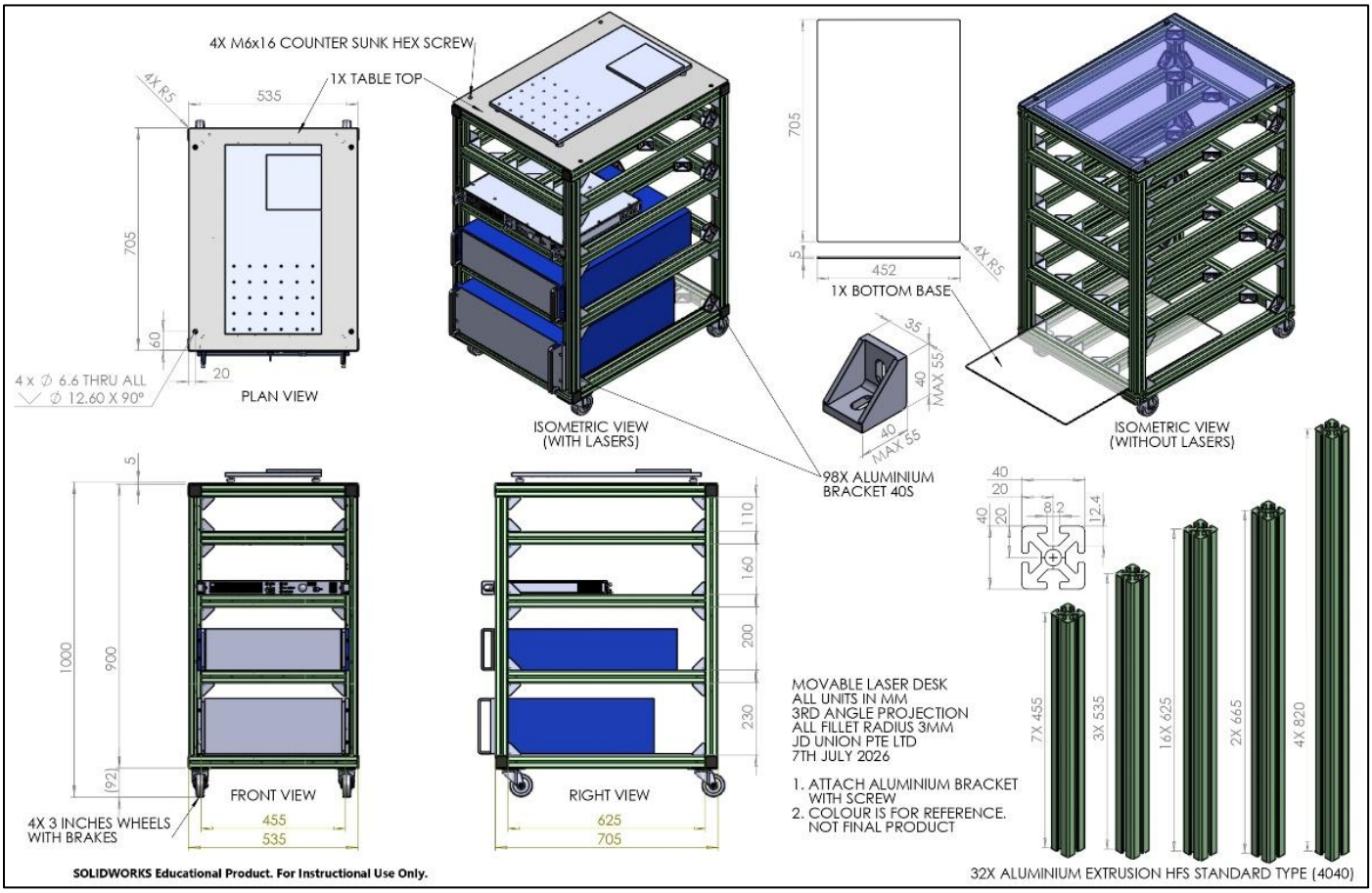

Figure 1. *3D assembly and dimensioned specification of a >250kg mobile laser workstation. Constructed with strictly constrained 4040 aluminium profiles to isolate dynamic vibrations during Class 4 optical testing.*

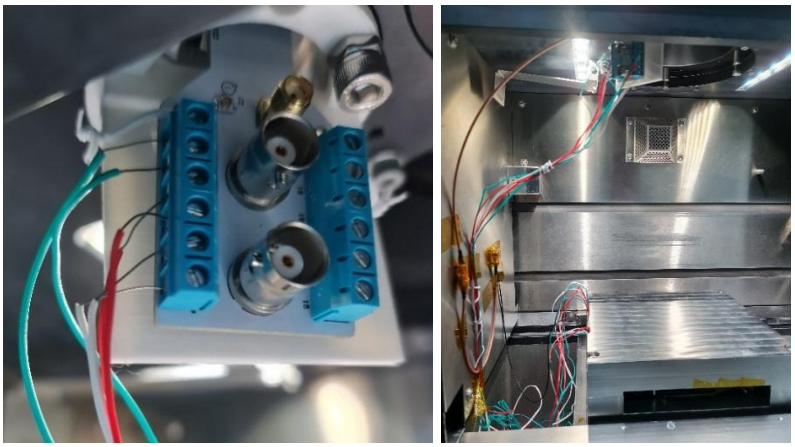

Figure 2. *Custom hardware modification of a LPBF EOS M 290. Engineered precision 13mm sensor ports to structurally route 12-channel DAQ signal cables, enabling deep physical machine validation without compromising chamber atmospheric tolerances.*

Explore the interactive 3D CAD model and complete project documentation at ***Clement.Builds***