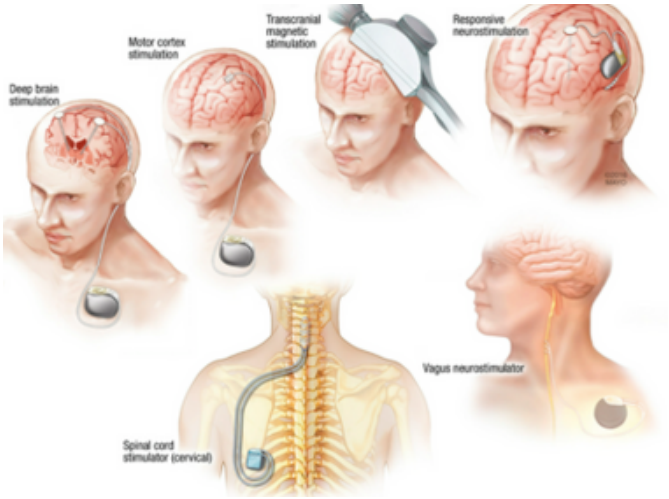
# VIVIAN NGUYEN

PRODUCT DEVELOPMENT ENGINEER

viviannguyen726@gmail.com | 682-240-3366 | linkedin.com/in/viviannguyen726 | MN, USA

## PRODUCT DESIGN FOR NEUROMODULATION DEVICE

**Company:** Resolution Medical
**System Contribution:** Design Feature Owner | Systems Thinking | Process Development
**Overview**: Supported the development of hardware for neuromodulation devices, taking ownership of a critical subfeature from user needs capture to prototyping, and influencing design decisions while enabling effective cross-disciplinary integration.




**Key Contribution:**

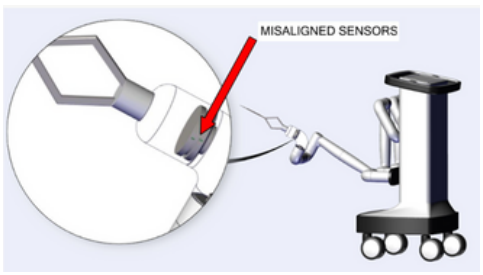
- Authored draft User Needs Document capturing safety, usability, and electrical performance with clinical and regulatory input.
- Led design selection by evaluating concepts for manufacturability, patient safety, and signal integrity, balancing electrical and mechanical tradeoffs.
- Collaborated with electrical, neuroscience, and manufacturing teams to meet multi-domain requirements and integrate with signal acquisition systems.
- Established test and fabrication processes, including alignment jigs, fixturing, and standardized verification protocols.
- Created and validated functional prototypes via 3D printing and CNC machining in preclinical setups.
- Ensured subsystem functionality within the entire system through bench and animal-model testing.
- Maintained ISO/FDA-compliant design documentation with traceability and early DHF inputs.

## ROBOTICS & CONTROL SIMULATION – SURGICAL ARM OPTIMIZATION

**Company**: Johnson & Johnson (via Forage Simulation)
**System Contribution:** Root Cause Analysis | Control Optimization | Design Proposal
**Overview:** Completed a simulation of a control systems intern role focused on optimizing the responsiveness and accuracy of a surgical robotic arm.

**Key Contributions:**

- Used Python-based control models to assess time delay and overshoot in robotic joint operation.
- Diagnosed key control inefficiencies linked to responsiveness and load tolerance.
- Created annotated diagrams proposing system adjustments to mechanical stops, sensor feedback, and controller tuning.
- Ran model-based performance evaluations to validate improvements in control loop behavior.
- Prepared a professional technical report and proposal with actionable design insights.



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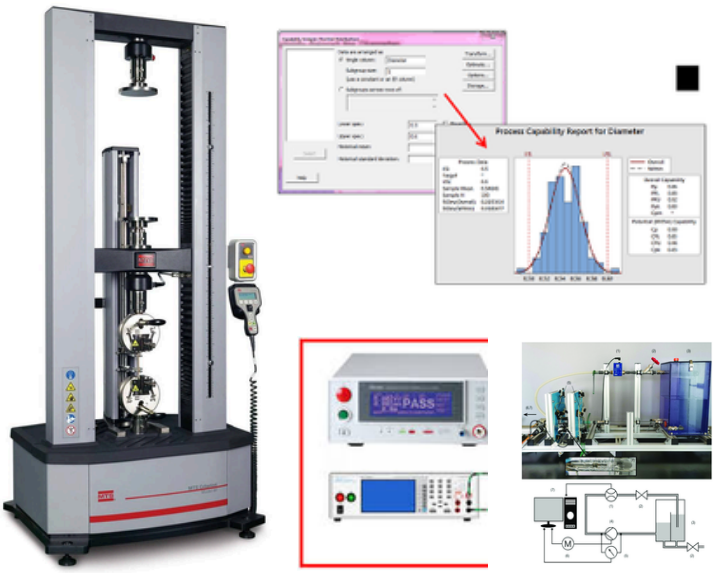
## DESIGN VERIFICATION TESTING (DVT) FOR MULTISYSTEM PROGRAMS

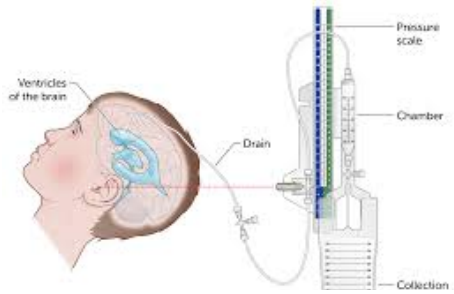
**Company:** Resolution Medical
**System Contribution:** Verification Execution | Risk Control Support | Regulatory Compliance
**Overview:** Led and supported DVT activities across neuromodulation and structural heart delivery systems to demonstrate design output compliance with input requirements.

**Key Contributions:**

- Linked design inputs to test outcomes using verification traceability matrices.
- Worked with regulatory, R&D, and quality engineering to align on verification strategies and protocols.
- Conducted mechanical, hydraulic, and fatigue testing under simulated clinical conditions.
- Investigated nonconformities and participated in root cause analysis and corrective actions.
- Generated test plans, reports, and summaries compliant with ISO 13485 and FDA design control requirements.




## HEAD MOTION TRACKER SYSTEM - UNIVERSITY PROJECT




**Institution:** University of Texas at Arlington
**System Contribution**: Full Lifecycle Engineering | Sensor Fusion | Safety Validation
**Overview:** Designed a real-time cranial motion tracker for External Ventricular Drainage (EVD) procedures, aimed at reducing catheter displacement risks during transport or repositioning.

**Key Contributions:**

- Designed the complete system integrating sensors, embedded hardware, and signal processing software.
- Combined Arduino-based IMU data with MATLAB/Python for real-time kinematic monitoring.
- Ran functional and boundary testing to ensure stability, precision, and usability in medical environments.
- Created sensor enclosures using SolidWorks, optimizing for sterilizability and patient comfort.
- Documented user needs, functional requirements, and testing results with full traceability.