

Rany Fouad

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EDUCATION

Columbia University

MS in Biomedical Engineering | GPA: 4.18

New York, NY

Expected Dec 2026

- *Coursework:* Musculoskeletal Biomechanics, Computational Modeling of Physiological Systems, Biomedical Innovation, Lab-to-Market, Cellular Bioengineering & Therapeutics, Biostatistics. *Audited:* Investing in MedTech (Columbia Business School)

Paris-Saclay University, CentraleSupélec

MEng in General Engineering (Dual-Degree with Columbia)

Paris, FR

Expected Dec 2026

- *Coursework:* Medical Robotics, Additive Manufacturing, Continuum Mechanics, Materials, Control of Dynamic Systems, Signal Processing, Statistics & Learning, Genomics & Synthetic Biology, Neuroscience, Corporate Finance

PROFESSIONAL EXPERIENCE

Columbia University – Creative Machines Lab (Prof. Hod Lipson)

Graduate Student Researcher

New York, NY

Jan 2026 – Present

- Designing and prototyping Chirobot, a 3-wheeled holonomic rehabilitation robot for chronic lower back pain: full-scale SolidWorks CAD, FDM fabrication, actuator selection, and closed-loop control implementation
- Developing experimental protocols to evaluate biomechanical performance under patient loads; analyzing system response data in Python to drive iterative mechanical and control design

Digital Unicorn

Technical Project Manager Intern

Da Nang, VN

Apr 2025 – Aug 2025

- Led 13 software & hardware projects (~\$330K) across cross-functional teams (developers, designers, SMEs); structured WBS, mapped deliverables to two-week agile sprints, maintained RAID logs
- Drove pilots and launches for ARD (mosquito-mapping platform), Dr.Sirop (VR hospital companion), and Vipy (accessible app)

French Embassy in Tunisia

Economic Officer Intern

Tunis, TN

Sep 2024 – Jan 2025

- Conducted analysis of Tunisian and Libyan healthcare sectors; identified opportunities for French medtech and pharma companies
- Produced analytic briefings; represented the Embassy in meetings with industrial partners during economic missions

KEY PROJECTS

Ventral Hernia Repair – Lab-to-Market Commercialization | Columbia University

Jan 2026 – May 2026

- Formulated a Class I regulatory pathway (21 CFR 878.4930) for a novel surgical traction device, leveraging predicate suture retention devices to accelerate FDA market entry
- Conducted competitive landscape review; designed a reimbursement strategy protecting hospital margins within the MS-DRG bundle by reducing OR operative time

Prognosight – Winner, Patient Safety Track | Columbia BME Hacking Health Hackathon

Feb 2026

- Won 48-hour hackathon Patient Safety track: dual-interface platform matching TNBC patients to clinical trials via a ranking engine using patient eligibility and projected outcomes

Bio-Mimetic Aortic Wall for EVAR Surgical Simulator | CentraleSupélec – LMPS

Feb 2024 – Apr 2024

- Designed a parametric woven mesostructure (SolidWorks) mimicking aortic tissue compliance; validated Von Mises stress under physiological blood pressure via FEA (COMSOL)
- Calibrated bi-material Stratasys PolyJet prints (VeroRigid + AgilusBlack) at 0.3 mm resolution for surgical training fidelity

Variable-Impedance Control for Minimally Invasive Surgical Robot | CentraleSupélec & ULB

Jan 2024 – May 2024

- Team leader on a 4-DOF surgical arm; derived kinematic model using Denavit-Hartenberg parameters and Lagrangian mechanics
- Built a variable impedance control architecture (MATLAB/Simulink) distinguishing tissue puncture from accidental operator impact, maintaining tool-tip precision under sudden external forces

TECHNICAL SKILLS

Mechanical Design & Simulation: SolidWorks, CATIA, COMSOL (FEA), Stratasys PolyJet, FDM Prototyping, GD&T

Control & Modeling: MATLAB/Simulink, Dynamic Systems Modeling, Impedance & PID Control, Denavit-Hartenberg kinematics

Programming & Data: Python (NumPy, pandas), MATLAB, SQL, Git, Excel

Regulatory & Translational: FDA Class I/II Pathways, 510(k) Predicate Analysis, QMS Standards, Market/Reimbursement Strategy

ADDITIONAL

Languages: French (native), English (fluent), Spanish (intermediate), Japanese (beginner)

Leadership: Hyris Television Production Manager (BNP Paribas, Allianz, BCG; €70K+ revenue, \$120K+ gear); President, Le Rush Film Festival; Columbia Club Water Polo – CWPA Nationals 2025

Volunteer: Nepal Asa International Solidarity Internship – built school sanitation facilities & tutored K–12 students