

YATIAN QU

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EDUCATION

Stanford University, Stanford, CA

M.S./PhD in Mechanical Engineering, **GPA 3.8/4.0**

09/2010-present

Zhejiang University, Hangzhou, China

B.S. in Chemical Engineering and Bioengineering, **GPA 3.96/4.0**

09/2006-06/2010

SUMMARY OF SKILLS

Research & Experimental

- Proficient in mechanical design, design testing, feasibility studies and prototype fabrication
- Strong skills in electrical instrumentation, microscopy, experimentation and prototyping
- Hands-on experience with circuit design, circuit analysis and mechatronics system design and implementation
- Expert-level in flow system design, mass transport study and system-level optimization: capacitive desalination system, microfluidics and mass transport in porous media
- Proficient in electrochemical characterization techniques: electrochemical impedance spectroscopy, cyclic voltammetry and etc.
- Knowledge of energy conversion systems: batteries, fuel cells, supercapacitors, and electrolytic systems

Programming, Simulation & Design

- Expert-level skills in mechanical design and instrumentation: AutoCAD, SolidWorks, LabVIEW
- Proficient in modeling and simulation software: COMSOL, ANSYS, LTSpice
- Strong skills in data analysis and programming: MATLAB, R, Python, C/C++, C3, D3, machine learning, image processing, data visualization
- Experience with PCB design: EAGLE

RESEARCH EXPERIENCE

Lawrence Scholar, Lawrence Livermore National Laboratory, Livermore, CA

05/2013-present

Research Assistant, Microfluidics Laboratory, Stanford University, Stanford, CA

Advisor: Juan G. Santiago, Michael Stadermann

High performance multi-stage flow-through capacitive desalination (CD) systems

- Design, optimize, build and test a high performance multi-stage capacitive desalination (CD) system to desalinate brackish water with the throughput of 1-2 L/hr, achieving 90% energy recovery efficiency.
- Develop a numerical model of multi-stage CD system in COMSOL to study mass transport through porous electrodes, and provide guidance to system design and performance optimization.
- Studied and characterized internal resistive components of CD systems using electrochemical diagnostic techniques. Developed a novel electrical contact configuration for CD systems to achieve energy consumption reduction by a factor of ten.
- Developed an equivalent circuit model to fully capture the charging or discharging dynamics of a CD system with porous electrodes using LTSpice.

Research Assistant, Microfluidics Laboratory, Stanford University, Stanford, CA

04/2012-02/2014

Simultaneous extraction and purification of DNA and proteins from complex biological samples

Advisor: Juan G. Santiago

- Developed a rapid on-chip microfluidics system to simultaneously purify and fractionate nucleic acids and proteins from human serum samples using isotachopheresis (ITP).
- Designed and fabricated a novel radially symmetric microfluidics chip using soft lithography technique.
- Developed the assay chemistry and successfully performed simultaneous extraction of human cell-free DNA and serum proteins (with albumin exclusion) within 30 min.

HONORS AND AWARDS

Lawrence Scholar Fellowship , Lawrence Livermore National Laboratory	12/2012 - present
Best Poster Award, 29 th International Symposium on Microscale Bioseparations	03/2013
Ginzton Research Assistantship Award , Stanford University	04/2010

TEACHING AND MENTORING EXPERIENCES

Teaching Assistant, Stanford University, Stanford, CA
Undergraduate classes: Introduction to Solid of Mechanics Physical Biology of Cell 2012 Spring
Graduate class: Optofluidics: Interplay of light and fluids at the micro and nanoscale 2011 Autumn
Research Mentor & Junior Graduate Students Advisor, Stanford University, Stanford, CA
Mentored five undergraduates and one high school student to conduct independent research projects.
Advised junior graduate students on courses enrollment, relationship with advisors and work-life balance.

JOURNAL PUBLICATIONS

Yatian Qu, Theodore F. Baumann, Juan G. Santiago, Michael Stadermann, “Characterization of internal resistance of a capacitive deionization system”, *Environmental Science & Technology*, vol. 49, Aug 7, 2015
Yatian Qu, Lewis A. Marshall, Juan G. Santiago, “Simultaneous purification and fractionation of nucleic acids and proteins from complex samples using bidirectional isotachopheresis”, *Analytical Chemistry*, vol. 86, pp. 7264–7268, Jun 19, 2014
Anita Rogacs, Yatian Qu, Juan G. Santiago, “Bacterial RNA extraction and purification from whole human blood using isotachopheresis”, *Analytical Chemistry*, vol. 84, pp. 5858-63, Jul 17, 2012
Yatian Qu, Juan G. Santiago, Michael Stadermann, “Energy consumption analysis of constant voltage and constant current operations of capacitive deionization”, manuscript in preparation, 2016
Yatian Qu, Juan G. Santiago, Michael Stadermann, “Modeling of a flow-through capacitive deionization cell for desalination performance prediction”, manuscript in preparation, 2016
Yatian Qu, Patrick Campbell, Jenny Knipe, Ali Hemmatifar, Juan G. Santiago and Michael Stadermann, “Increasing desalination capacity of flow-through capacitive deionization through phased charging”, manuscript in preparation, 2016

SELECTED CONFERENCES PUBLICATIONS AND PRESENTATIONS

Yatian Qu, Juan G. Santiago, Michael Stadermann, “Resistance characterization and operation optimization of a capacitive deionization system”, Poster session, Gordon Research Conference on Microfluidics, Physics and Chemistry, West Dover, VT, June, 2015
Yatian Qu, Juan G. Santiago, Michael Stadermann, “Characterization of internal resistance of a capacitive deionization system”, Oral presentation, 8th International Conference on Interfaces against Pollution, Leeuwarden, Netherlands, May, 2014
Yatian Qu, Lewis A. Marshall, Juan G. Santiago, “Simultaneous purification and fractionation of nucleic acids and proteins from complex samples using bidirectional isotachopheresis”, Poster session, **Best poster award**, 29th International Symposium on Microscale Bioseparations, Charlottesville, VA, March, 2013

EXTRACURRICULAR ACTIVITIES

Vice President, Stanford Energy Club (SEC), Digital & Brand team 03/2015- present

- Lead a 6-person team to promote engagement of SEC communities through marketing and branding strategies. Initiate and lead “SEC Big Data” program to review club growth.

Founder, Stanford-Zhejiang University (ZJU) Alumni Group 06/2012-06/2015

- Enhance social bonding between ZJU alumni at Stanford by organizing mixers and activities.

Team member, SunPower Foundation project, Engineering for Sustainable World, Stanford 11/2015-present

- Design solar-powered lighting and refrigeration systems for small-community use in rural areas of developing countries.

Finance Officer, Mechanical Engineering Women Group 09/2012-09/2013

- Organized events and managed group funding and expenses.

Volunteer, Visitor Service, Cantor Art Center, Stanford, CA 05/2012-12/2012