KARINA TORRES

GRADUATE RESEARCH ASSISTANT 4348060604

DETAILS

4348060604
kt2fe@virginia.edu

LINKS

LinkedIn

Home page

HOBBIES

Reading, music, swimming, and multipurpose furniture

PROFILE

I am a Ph.D. student at the Charles L. Brown Department of Electrical and Computer Engineering at the University of Virginia. My research relies on the intersection of electronics and biological entities. I am particularly interested in manipulating cells for characterization and separation using microfluidic chips coupled with electric fields. My research encompasses microfabrication, biological sample preparation, computational fluid dynamics, microfluidics, and electrokinetics.

EDUCATION

Ph.D. Student, University of Virginia, Charlottesville
August 2016 — Present

As a research assistant, I work developing novel microfluidic platforms to characterize biological samples (i.e. cells) based on their electrical responses towards an applied electric field and/or mechanical stress on a chip. For this purpose, I perform computational fluid dynamics (CFD) studies to design the devices that I fabricate, using standard microfabrication techniques in electronics but repurposed for microfluidic applications. As a research assistant, I constantly mentor students on how to perform microfluidic experiments, fabricate their devices, and help them get started with the CFD tools for understanding and optimize their devices. Cumulative GPA: 3.844

MS. in Electronics (MEMS) , Tecnologico de Costa Rica, Cartago
January 2013 — July 2016

summa cum laude

Licenciate (BS+Thesis) in Chemical Engineering, Universidad de Costa Rica, San Jose
March 2002 — December 2008

PUBLICATIONS & CONFERENCES

Self-aligned sequential lateral field non-uniformities over channel depth for high throughput dielectrophoretic cell deflection.

XuHai Huang, Karina Torres-Castro, Walter Varhue, Armita Salahi, Ahmed Rasin, Carlos Honrado, Audrey Brown, Jennifer Guler, Nathan S. Swami.

(Selected for Lab on a Chip HOT Articles 2021)

High-throughput dynamic analysis of dielectrophoretic frequency dispersion of single-cells based on deflected flow stream lines.

Karina Torres-Castro, Carlos Honrado, Walter B.Varhue, Vahid Farmehini, Nathan S. Swami.

Analytical and Bioanalytical Chemistry (2020) 412:3847–3857 (Selected in Forefront)

Combined electrokinetic manipulations of pathogenic bacterial samples in low-cost fabricated dielectrophoretic devices.

Alejandro Martínez-Brenes, Karina Torres-Castro, Richard Marín-Benavides, Katherine Acuña-Umaña, Christopher Espinoza-Araya, et al.

AIP Advances **9**, 115303 (2019)

MicroTAS 2020 , virtual
October 2020

Biomechanical Markers for Monitoring Heterogeneity in Islet Reorganization Dynamics with Adipose Stem Cells. (Poster presentation)

AES Electrophoresis Society, Atlanta
October 2018

Microfluidic Dieletrophoretic Cytometry for Single-Cell Analysis to Quantify Phenotypic Heterogeneity (Poster)

Air Force Office of Scientific Research meeting (AFOSR), Arlington
September 2017

Aptamer-Based Nanoslit Platforms for Characterizing Human Performance Biomarkers (Oral presentation)

Dielectrophoresis 2016, Boston
July 2016

Low-cost Fabrication of Dielectrophoretic Devices for Electrokinetic Characterization of Tropical Infectious Bacterial Samples (Poster)

EXTRA-CURRICULAR ACTIVITIES

President at Electrical and Computer Eng. (ECE) Graduate Student Council
2020 — 2021

Organizing ECE graduate student events, act as a proxy for students and faculty and promote discussions on students' concerns and ideas.

Vice President at ECE Graduate Council
2019 — 2020

Co-Chaired the Fundamentals of Electrokinetics session at 2019 AES Electrophoresis Society meeting
October 2019

AWARDS/MEMBERSHIPS

Sture G. Olsson Fellowship in Engineering
2020

iRedefine grant award (NSF professional development workshop)
2020

Outstanding Graduate Teaching Award, School of Engineering and Applied Science (ECE)
2018

Member of American Association of Advancement of Science (AAAS) and Society of Women Engineers (SWE)

EMPLOYMENT HISTORY

Solar energy consultant at IguanaSolar (Start-up)
March 2013 — June 2016

Founded a start-up company for the commercialization of solar energy and worked on the first national policy for distributed generation in Costa Rica with the Costa Rican Association of Solar Energy.

R&D Engineer at CELEQ (Universidad de Costa Rica)
March 2011 — February 2015

Applied research on dye-sensitized solar cells, worked with a US Department of Energy (ECPA) grant for developing a sustainable energy model for Central American coffee milling sector and wrote a technical manual of renewable energy for agro-industry (ISBN: 978-9968-919-14-2)

Process Engineer at Firestone Industrial Products
June 2009 — February 2011

In charge of continuous improvement of vulcanization processes, raw materials, and technical support of the manufacturing plant. Lean six-sigma methods (Green Belt). Startup and stabilization of plant rubber calender.

RF and Materials Research Intern at Ad Astra Rocket Company
January 2009 — May 2009

Designed and performed statistical experiments to test ceramics for rapid cooling and electrical isolation from a rocket propulsion plasma reactor. Designed and fabricated an impedance matchbox for dielectrics prototype.