

Kangfu Chen

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Summary

A highly motivated Ph.D. candidate with four-year-experience of Computational Fluid Dynamic modeling for microfluidic devices based on COMSOL Multiphysics, microfabrication technics, and knowledge of mechanical engineering basic theory & industrial application, seeking a full-time position.

Education

University of Florida, Gainesville, Florida, USA		
Ph.D. Mechanical Engineering	2013. 08—Expected 2018. 12	(GPA 3.8/4.0)
University of Florida, Gainesville, Florida, USA		
M.S. Aerospace Engineering	2013. 08—2015. 05	(GPA 3.8/4.0)
University of Science and Technology of China, Hefei, Anhui, China		
B.S. Mechanical Engineering	2009. 09—2013. 06	(GPA 3.5/4.0)

Skills and Expertise

- **Simulation Tools & CAD Software:** COMSOL Multiphysics, AutoCAD, SolidWorks, Abaqus, SketchUp, L-Edit
- **Programing and Data Analysis:** MATLAB, NI LabView, ImageJ, Adobe Photoshop, Origin, Excel, CellSens Imaging System
- **Hands-on skills in Micro-fabrication:** MA6 Mask Aligner, Litho Process Headway E-Beam Bay, Spin coater, KJL DC Sputter, Deep Reactive Ion Etching (DRIE), General Acid/Bases Bench, Lift off solvent bench
- **Test and Device Characterization:** CNC Milling Machine, Intelligent Paper Plotter, Film Laminator, Centrifuge, Fluorescence microscope

Professional Experience

Graduate Research Assistant: University of Florida 2013-present
Microfluidics and BioMEMS laboratory, Interdisciplinary Microsystems Group, University of Florida, Gainesville, FL.

Research Projects

- **Lateral filter-based microfluidic device for enrichment of rare cancer cells.**
 - Hydrodynamic resistance network model building using MATLAB.
 - Flow field visualization and hydrodynamic resistance model validation using COMSOL.
 - Cancer cell-filters interaction simulation based on flow-structure interaction in COMSOL.
 - Fabrication of the microfluidic device and its application for Rare cell enrichment.
- **Cancer cell-Microfluidic device surface interaction modeling.**
 - Simulation of fluid flow in microchannels using COMSOL.
 - MATLAB Modeling of a cancer cell 3D structure, receptor density, receptor distribution.
 - Modeling of translation and rotational motion of a cancer cell running in a microchannel.
 - Modeling of ligand distribution on device surface and receptor-ligand interaction.
- **Centrifuge based integrated microfluidic device for circulating tumor cells isolation**

- Simulation of microflow in the microchannel with application of centrifugal force in COMSOL.
- Flow path prediction and optimization of cancer cell in the microchannel using COMSOL.
- Integration of the fluidic system in the centrifuge and hydrodynamic characterization of the fluidic system.
- Cell line testing using the centrifuge based integrated microfluidic device.
- **Design and fabrication of micropillar based devices and micro-heaters.**
 - Design microchannels and features of a microfluidic device with AutoCAD.
 - Photoresist coating and features transmission to silicon wafer through Photolithography.
 - DRIE or wet etching process to produce feature of micropillar or microwells.
 - PDMS device fabrication through soft lithography, surface modification, and bonding.
 - Sputter Deposition of metals on transparent plastic film for heater circuit formation.
- **Vacuum bag-based bonding of multi-layer COC plastic devices.**
 - Fabrication of COC substrate through hot embossing process.
 - Alignment and initial stick of COC substrate, plastic cover layers, and glass bottom.
 - Simple vacuum bag fabrication with laminating parts totally sealed inside.
 - Heat treatment on Oven to induce molecule crosslinks between different layers.

Graduate Teaching Assistant:

University of Florida 2013-present

- Mentored and facilitated 5 tutorial sections for undergraduates in Fluid Mechanics and Numerical Methods.
- Advised students on course material, class projects, and homework.
- Assisted faculty with curriculum issues and administrative work.

Selected Awards

MAE Graduate Student Research Award at UF	2018
Best Group member in Microfluidics & BioMEMS Laboratory	2015, 2018
Mechanics Base Talent Award at USTC	2012

Selected Publications

- Chen, K. *et al.* Tumor cell capture patterns around aptamer-immobilized microposts in microfluidic devices. *Biomicrofluidics* **11**, 054110 (2017).
- Chen, K. & Hugh Fan, Z. Introduction to Microfluidics. *Circulating Tumor Cells: Isolation and Analysis*, 33-50 (2016).
- Chen, K., Georgiev, T., & Fan, Z. H. Interactions Between Circulating Tumor Cells and Aptamer-Functionalized Microposts in a Flow. In ASME 2017 IMECE (pp. V007T09A045-V007T09A045).
- Zhang, J., Chen, K. & Fan, Z. Chapter One-Circulating Tumor Cell Isolation and Analysis. *Advances in clinical chemistry* **75**, 1-31 (2016).
- Varillas, J. I., Chen, K., Zhang, J., George, T. J. & Fan, Z. H. in *Circulating Tumor Cells* 33-53 (Springer, 2017).
- Fan, Z. H., Varillas, J. I., Zhang, J., Chen, K. & George, T. J. in *Micro Electro Mechanical Systems (MEMS), 2017 IEEE 30th International Conference on.* 1264-1267 (IEEE).

Activities and Societies:

- Leadership Council, Interdisciplinary Microsystem Group (IMG) 2015-2018
- Graduate Student Council of Mechanical and Aerospace Engineering Department 2015-2016