Suin Shim

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Dept. of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ

EDUCATION

Princeton University, Princeton, NJ, USA
Ph.D Candidate, Mechanical and Aerospace Engineering — Oct. 2012 –
M. A., Mechanical and Aerospace Engineering — Sept. 2010 – Oct. 2012

Pohang University of Science and Technology (POSTECH), Pohang, S. Korea
B.S., Mechanical Engineering, *m.c.l.* — Mar. 2006 – Feb. 2010

RESEARCH INTERESTS

- Coalescence cascade of liquid drops
- Theories on thin film flow with various boundary conditions
- Evaporation of water film on a superhydrophilic surface
- Multicomponent gas exchange in a microfluidic channel
- Diffusiophoresis around microbubbles

PUBLICATIONS

Journal Papers:

S. Shim and H. A. Stone, "Damped coalescence cascade of liquid drops" *in preparation*

S. Shim, S. Shin, F. Meggers, E. Bou-Zeid and H. A. Stone, "Controlled evaporative cooling on a superhydrophilic surface and possible applications of green walls" *in preparation*

S. Shim, J. Wan, S. Hilgenfeldt, P. Panchal, and H. A. Stone, "Dissolution without disappearing: multicomponent gas exchange for CO_2 bubbles in a microfluidic channel" *Lab Chip* 2014,**14**, 2428-2436

Conference Proceedings:

S. Shim, S. Lee, and KH Kang, "Meniscus vibration at the tip of piezoelectric inkjet nozzle: observation and

analysis" 2009 Korean Society of Mechanical Engineers (KSME) Fall's Conference, Yongpyong, S. Korea, Nov. 2009

TALKS & POSTERS

- Surfactants on gas-liquid interfaces, UNIST IBS Center for Soft and Living Matter, Ulsan, South Korea, June 2015 (Invited Speaker, 60 min. seminar)
- Damped coalescence cascade of liquid drops, IACIS 2015, Mainz, Germany, May 2015 (20 min. talk)
- Damped coalescence cascade of liquid drops, 2014 APS DFD Meeting, San Francisco, CA, Nov. 2014 (12 min. talk)
- Dissolution without shrinking: a microfluidic study of multicomponent gas bubble dissolution, 2012 APS DFD Meeting, San Diego, CA, Nov. 2012 (12 min. talk)
- Dissolution without shrinking: CO_2 microbubbles in a channel flow, 2011 APS DFD Meeting, Baltimore, MD, Nov. 2011 (12 min. talk)

RESEARCH EXPERIENCE

Complex Fluids Lab, Princeton University, USA Sept. 2010 –
Doctoral Research with Prof. Howard A. Stone (advisor)

- Microfluidic studies on multicomponent gas exchange using CO_2 gas bubble
- Damped coalescence cascade of liquid drops on liquid bath: effect of surfactant concentration gradient on rapid air drainage
- Green wall project: effective cooling of buildings using evaporation of thin water film

Electro-MicroFluidics Lab, POSTECH, S. Korea Jun. 2009 – Feb. 2010
Undergraduate Research Program (URP) with Prof. Kwan Hyoung Kang and Dr. Sanghyun Lee (co-advised)

- Meniscus vibration at the tip of piezoelectric inkjet nozzle: observation and analysis

Pohang University of Science and Technology (POSTECH), S. Korea Sept. 2008 – Jun. 2009
Senior Design Project with Prof. Dongsik Kim

- Target Chasing MAV (micro air vehicle): development of automatic target chasing system using infrared sensor
- Top ranked at final demonstration

TEACHING EXPERIENCE

Assistant in Instruction (AI), Princeton University, USA
Holding regular precept & office hours, preparing course materials, grading and advising student projects

- Mathematics in engineering I (MAE305), Prof. Howard A. Stone — Fall 2015
- Viscous Flow and Boundary Layers (MAE552), Prof. Howard A. Stone — Spring 2015
- Mechanics of Fluids (MAE222), Prof. Marcus N. Hultmark — Spring 2014
- Mathematics in engineering I (MAE305) Prof. Howard A. Stone — Fall 2013

HONORS & AWARDS

Samsung Scholarship, Samsung Foundation of Culture — Sept. 2009 – Jun. 2015

- Full tuition and living expenses for Ph. D studies ($50,000 per year)
- Competitive and merit-based scholarship

Korean Society of Mechanical Engineers (KSME) — Nov. 2009

- Fluid Mechanics Research Competition for Undergraduate Students – **Grand Prize (The First Prize)**

Diploma of Honors, Pohang University of Science and Technology — Sept. 2006 – Jun. 2009

- Given to undergraduate students with grades above 3.8/4.3

National Science & Engineering Scholarship, Korea Student Aid Foundation (KOSAF) — Mar. 2006 – Feb. 2010

- Full tuition for undergraduate studies

SKILLS

Languages: Korean (native), English (fluent in reading, writing and speaking)

Computing software: Matlab, Mathematica, C, COMSOL Multiphysics

CAD and fabrication: Solidworks, AutoCAD, G-code for CNC processing

REFERENCES

Prof. Howard A. Stone
Professor, Dept. of Mechanical and Aerospace Engineering, Princeton University
hastone@princeton.edu

Prof. Jiandi Wan
Assistant Professor, Microsystems Engineering, Rochester Institute of Technology (RIT)
jdween@rit.edu

Dr. Sanghyun Lee
CEO, Femtofab Co., Ltd/ Research Professor, Dept. of Mechanical Engineering, Pohang University of Science and Technology (POSTECH)
toshlee@hotmail.com

Curriculum Vitae
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