

## Dr.M.K.S.Verma

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| RESEARCH INTEREST       | Fluid Mechanics, Flow instability in flexible channel/tube, Microfluidics, Medical Devices, Bio-inspired design, Lithium-ion batteries, Electrochemical modeling, Battery management system (BMS).                                                                                                                                                                                                       |              |
| EDUCATION               | <b>Ph.D.</b> , Chemical engineering department, IISc Bangalore, INDIA<br>Advisor: <b>Prof. V.Kumaran</b>                                                                                                                                                                                                                                                                                                 | 2007-2013    |
|                         | <b>M.Tech.</b> , Chemical engineering department, IIT Kanpur, INDIA<br>Advisor: <b>Prof. A.Ghatak</b>                                                                                                                                                                                                                                                                                                    | 2005-2007    |
|                         | <b>B.Tech.</b> , Chemical engineering department, IET Lucknow, INDIA                                                                                                                                                                                                                                                                                                                                     | 2001-2005    |
| PROFESSIONAL EXPERIENCE | <b>Assistant Professor</b> , Indian Institute of Technology, Delhi, INDIA                                                                                                                                                                                                                                                                                                                                | 2019-Present |
|                         | <b>Chief Engineer</b> , Samsung R&D Institute, Bangalore, INDIA                                                                                                                                                                                                                                                                                                                                          | 2015-2019    |
|                         | <b>Postdoctoral Research Fellow</b> , Harvard Medical School, Boston, USA                                                                                                                                                                                                                                                                                                                                | 2013-2015    |
| HONORS AND AWARDS       | Samsung Citizen Award, Samsung R&D Institute, INDIA                                                                                                                                                                                                                                                                                                                                                      | 2018         |
|                         | DST Travel Award, AIChE Conference, Pittsburgh, USA                                                                                                                                                                                                                                                                                                                                                      | 2012         |
|                         | Institute Travel Grant, AIChE Conference, Pittsburgh, USA                                                                                                                                                                                                                                                                                                                                                | 2012         |
|                         | Research Assistantship, MHRD, India                                                                                                                                                                                                                                                                                                                                                                      | 2007-2013    |
|                         | Research Scholarship, MHRD, India                                                                                                                                                                                                                                                                                                                                                                        | 2005-2007    |
|                         | Cash Award for Journal Publication (Rs.10000), IIT Kanpur                                                                                                                                                                                                                                                                                                                                                | 2007         |
| PUBLICATIONS            | Girish D Chitnis, <b>Verma, M. K. S.</b> , Julien Lamazouade, Miguel Gonzalez-Andrades, Kisuk Yang, Ali Dergham, Peter Anthony Jones, Benjamin E Mead, Andrea Cruzat, Zhixiang Tong, Keir Martyn, Aniruddh Solanki, Natalie Landon-Brace, Jeffrey M Karp, <i>A resistance-sensing mechanical injector for the precise delivery of liquids to target tissue</i> , Nature Biomedical Engineering, 2019, 1. |              |
|                         | <b>Verma, M. K. S.</b> , Suman Basu, Krishnan S Hariharan, Kolake Subramanya Mayya, Taewon Song and Taejung Yeo, <i>A Strain-Diffusion Coupled Electrochemical Model for Lithium-Ion Battery</i> , Journal of The Electrochemical Society, 2017, 164, 13, A3426-A3439.                                                                                                                                   |              |
|                         | Piyush Tagade, Krishnan S Hariharan, Suman Basu, <b>Verma, M. K. S.</b> , Kolake Subramanya Mayya, Taewon Song, Dukjin oh, Taejung Yeo and Seokgwang Doo, <i>Bayesian calibration for electrochemical thermal model of lithium-ion cells</i> , Journal of Power Sources, 2016, vol. 320, pp. 296-309.                                                                                                    |              |
|                         | <b>Verma, M. K. S.</b> , and V. Kumaran, <i>Stability of the flow in a soft tube deformed due to an applied pressure gradient</i> , Physical Review E, 2015, vol. 91, no. 4, 043001.                                                                                                                                                                                                                     |              |
|                         | <b>Verma, M. K. S.</b> , and V. Kumaran, <i>Effect of ultra-fast mixing in a microchannel due to a soft wall on the room temperature synthesis of gold nanoparticles</i> , Sadhana, Springer India, 2015, vol. 320, 1-11.                                                                                                                                                                                |              |
|                         | <b>Verma, M. K. S.</b> , and V. Kumaran, <i>A multifold reduction in the transition Reynolds</i>                                                                                                                                                                                                                                                                                                         |              |

*number, and ultra-fast mixing, in a micro-channel due to a dynamical instability induced by a soft wall*, J. Fluid Mech ,2013, vol. 727, 407-455.

**Verma, M. K. S.**, and V. Kumaran, *A dynamical instability due to fluid-wall coupling lowers the transition Reynolds number in the flow through a flexible tube*, J. Fluid Mech ,2012, vol. 705, 322-347.

**Verma, M. K. S.**, Ganneboyina, S., Rakshith, V. and Ghatak, A., *Three dimensional multi-helical microfluidic mixers for rapid mixing of liquids*, Langmuir, 2008, 24(5), 2248-2251.

**Verma, M. K. S.**, Majumder, A. and Ghatak, A., *Embedded template-assisted fabrication of complex microchannels in pdms and design of a microfluidic adhesive*. Langmuir, 2006, 22, 10291-10295.

#### CONFERENCE

**Verma, M. K. S.**, *Real-time On-board Voltage and SOC Estimation for Composite Battery Packs: Achieving Accuracy and Computational Efficiency through an Electrochemical Model*, 6th International Conference & Exhibition on Energy Storage, EV & Microgrids in India, January 10-11, 2019.

**Verma, M. K. S.**, *Transition and ultra-fast mixing in micro-channel due to a dynamical instability induced by a soft wall*, IUTAM Symposium on transition and turbulence in flow through deformable tubes and channels, Bangalore, India, 2014.

**Verma, M. K. S.**, and V. Kumaran, *Rapid mixing in microchannel due to flow instability induced by flexible wall*, AIChE Conference, Pittsburgh, USA 2012.

**Verma, M. K. S.**, *Experimental study of flow through flexible tubes*, Advanced Stability Methods winter workshop JNCASR, Bangalore, 2011.

**Verma, M. K. S.**, Indo-US workshop on microfluidics and fabronics (microfabrication), IIT Kharagpur, 2009.

Ghatak A.,**Verma, M. K. S.**, and Majumder, A.,*Template Assisted Fabrication of Complex microchannels and design of a micro-mixer and a micro-fluidic adhesive*, Gordon Research Conference on Physics and Chemistry of Microfluidics, Florida, USA 2007.

#### PATENTS

V.Kumaran, and **Verma, M. K. S.**, *Microfluidic Device*, **US Patent 9,463,460**, Oct 2016.

#### INVITED TALKS

**Verma, M. K. S.**, *Microfluidics for cell migration*, Motivational talk to school students, Brigham and Women's Hospital, Boston, USA, 2015.

**Verma, M. K. S.**, *Microfluidics: A versatile platform for biomedical applications*, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India, 2014.

**Verma, M. K. S.**, *Career in science and engineering*, Lecture to Japanese Students @ MIT, Boston, USA, 2014.