Cover letter

|  |  |
| --- | --- |
| Rahul Sahay  Engineering Product Development,  Singapore University of Technology and Design, Singapore  8 Somapah Road, 487372 |  |
|  |  |

Dear Sir,

I, Rahul is working as a Postdoctoral fellow at EPD, SUTD, Singapore. My research work includes design of nanomaterial for advanced applications, specializing in the design of Bioinspired Pressure-sensitive adhesive systems. I am also working on designing 3D nanoprinting system based on melt electrospinning. I completed my PhD at Fluid division, Mechanical engineering department, NUS, Singapore. During my tenure as Research Scholar, experimentation and theoretical analysis of electrospinning, technique employed for the production of nanomaterial is performed. During my tenure as Research Associate, from July 2010 to July 2012 at MSE, NTU Singapore, I applied these electrospun nanomaterials in a variety of applications. These applications include dye sensitized solar cell, photocatalyst and lithium-ion batteries. Nanomaterial fabricated for these applications include semiconductor metal oxides (titanium oxide, etc.), carbon, polymer, and composite nanofibers.

As an Assistant Professor at Amity University, India, Postdoctoral fellow at SUTD and teaching assistant at the National University of Singapore, I have gained valuable experience leading undergraduate discussion sections. My training as a researcher and a teaching instructor has provided me with relevant traits such as a team player, forward-thinker as well as self-improving and motivated individual essential for a Faculty position. My traits have provided me with ample motivation to achieve the desired goal, i.e. achieves higher productivity with greater yield.

I hereby respectfully submit this letter of application for Faculty position. I am enclosing the detailed resume for your consideration. I look forward to hearing from you.

Yours Sincerely,

Rahul Sahay

Name: Dr. Rahul Sahay

E-mail: Rahul@sutd.edu.sg, mr.rahul.sahay@gmail.com

Contact Address: #02-07, 53 Changi South Avenue 1, Singapore, 485996; Contact Number: 65-83114382

**WORKING EXPERIENCE**

**Post-Doctoral Fellow, SUTD, Singapore (Since Aug 2014)**

* Design of nanomaterial for advanced applications
* Design of Bio-inspired Pressure-sensitive adhesive systems
* Development of fibrous 3D printer for fabricating flexible electronics
* Undergraduate/Graduate students are assisted during their Final year / PhD Projects.

**1**

* Modules such as Fluid Mechanics, Computational fluid dynamics, and Heat Transfer are taught
* Undergraduate/Graduate students are assisted during their Final year Projects.

**Research Associate, MSE, NTU, (Jul 2010- Jul 2012)**

* Design of Photovoltaic solar cells
* Composite nanomaterial for energy applications such as battery and solar cells
* Electrospinning of nanofibers
* Assisted undergraduate as well as graduate students in their projects

**Graduate Tutor, National University of Singapore (Jan – Jul 2008)**

* Modules comprising of Fluid mechanic and Turbo-machinery had been tutored at the undergraduate level.

**Teaching Assistant, National University of Singapore, (Jan - Dec 2007)**

* Lab sessions in Fluid mechanics laboratory were conducted and supervised.

**Intern at TATA Motors, Pune, India (Jul – Dec 2005)**

* Simulation and tool design for a sheet metal component was performed.
* The emphasis was given to reducing the distortion of the tool steel over time.

**EDUCATION**

**PhD** **National University of Singapore, Singapore (Jan 2006 – Jul 2013)**

* Experimental analysis of flow regimes pertaining to electrospinning from a polymer drop was performed.
* Modules such as Advanced Computational Fluid Dynamics, Industrial Aerodynamics, Convective Heat Transfer, and Optical Techniques in Experimental Stress analysis were studied.
* Undergraduate students were assisted during their Final year Projects.

**Master of Engineering Birla Institute of Technology and Science, Pilani, India (Jan 2004 – Dec 2005)**

* Achieved CGPA of 9.40 out of 10
* Basic Computational modules such as Computer Aided Design and Computational Fluid Mechanics were studied.
* Undergraduate students were assisted and supervised during their Mechanical Engineering Lab sessions.

**Bachelor of Technology****Aligarh Muslim University, Aligarh, India (Jul 1999 – Jul 2003)**

* Achieved mechanical Engineering degree with CGPA of 8.34 out of 10

**Selected journal publications**

***H-index: 7; i10-index : 7; Total number of citations: 384 (courtesy google citations:*** [***https://scholar.google.co.in/citations?user=h8kprQUAAAAJ&hl=en***](https://scholar.google.co.in/citations?user=h8kprQUAAAAJ&hl=en)***)***

* R. Sahay, C. J. Teo, Y. T. Chew, New correlation formulae for the straight section of the electrospun jet from a polymer drop, ***Journal of fluid mechanics*,** 735 (2013), 150–175 (*impact factor: 2.4*).
* R. Sahay, Hashina Parveen, Anpanman S. Ranganath, V. Anand Ganesha and Avinash Baji, On the adhesion of hierarchical electrospun fibrous structures and prediction of their pull-off strength, ***RSC Advances***, 6 (2016), 47883-47889 (*impact factor: 3.8*).
* R. Sahay, P. S. Kumar, R. Sridhar, J. Sundaramurthy, J. Venugopal, S. G. Mhaisalkar, S. Ramakrishna, Electrospun composite nanofibers and their multifaceted applications, ***Journal of Materials Chemistry***, 22 (2012) 12953-12971 (*impact factor: 6.6*).
* R Sahay, H Parveen, A Baji, VA Ganesh, AS Ranganath, Fabrication of PVDF hierarchical fibrillar structures using electrospinning for dry-adhesive applications, **Journal of Materials Science** (2016). doi:10.1007/s10853-016-0537-9 (*impact factor:* 2.3).
* R Sahay, A Baji, AS Ranganath, V Anand Ganesh, Durable adhesives based on electrospun poly (vinylidene fluoride) fibers, **Journal of Applied Polymer Science** 134 (2017) (impact factor: 1.6).
* R. Sahay, J. Sundaramurthy, P. S. Kumar, V. Thavasi, S. G. Mhaisalkar, S. Ramakrishna, Synthesis and characterization of CuO nanofibers, and investigation for its suitability as blocking layer in ZnO NPs based dye sensitized solar cell and as photocatalyst in organic dye degradation, ***Journal of Solid State Chemistry***, 186 (2012) 261-267 (*impact factor: 2.4*).
* R. Sahay, P. S. Kumar, V. Aravindan, J. Sundaramurthy, W. C. Ling, S. G. Mhaisalkar, S. Ramakrishna, S. Madhavi, High aspect ratio electrospun CuO nanofibers as anode material for lithium-ion batteries with superior cycleability, ***Journal of Physical Chemistry C***, 116 (2012) 18087-18092 (*impact factor: 4.8*).
* R. Sahay, C. J. Teo, S. T. Thoroddsen, Laser-induced onset of electrospinning, ***Physical Review E - Statistical, Nonlinear, and Soft Matter Physics***, 81 (2010) (*impact factor: 2.3*).
* R. Sahay, V. Thavasi, S. Ramakrishna, Design modifications in electrospinning setup for advanced applications, ***Journal of Nanomaterial***, 317673 (2011) (*impact factor: 1.6*).
* A. Góra, **R. Sahay**, V. Thavasi, S. Ramakrishna, Melt-electrospun fibers for advances in biomedical engineering, clean energy, filtration, and separation, ***Polymer Reviews***, 51 (2011) 265-287 (*impact factor: 6.6*).
* P. S. Kumar, **R. Sahay**, V. Aravindan, J. Sundaramurthy, W. C. Ling, V. Thavasi, S. G. Mhaisalkar, S. Madhavi, S. Ramakrishna, Free-standing electrospun carbon nanofibres - A high performance anode material for lithium-ion batteries, ***Journal of Physics D: Applied Physics***, 45 (2012) (*impact factor: 2.5*).
* R. Sahay, H. Y. Low, A. Baji, F. Shaohui, K. L. Wood, A State-of-the-Art Review and Analysis on the Design of Dry Adhesion Materials for Applications such as Climbing Micro-robots, ***RSC Advances***, (2015) (*impact factor:* 3.8).
* R. Sahay, V. J. Reddy, S. Ramakrishna, Synthesis and applications of multifunctional composite nanomaterials, ***International Journal of Mechanical and Materials Engineering***, 9 (2014) (*impact factor:* 0.9).
* V Anand Ganesh, Anupama Sargur Ranganath, Radhakrishnan Sridhar, Hemant Kumar Raut, Sundaramurthy Jayaraman**, Rahul Sahay**, Seeram Ramakrishna, Avinash Baji,"Cellulose Acetate–Poly (N‐isopropylacrylamide)‐Based Functional Surfaces with Temperature‐Triggered Switchable Wettability," ***Macromolecular rapid communications,*** 14(2015) (impact factor 4.9)

**Conferences attended**

* R. Sahay, C. J. Teo, Y. T. Chew, S. T. Thoroddsen, “Branching of an electrospinning fiber,” 62nd Annual Meeting of the Division of fluid Dynamics, APS, 22-24 Nov, 2009, Minnesota, USA.
* R. Sahay, A. Baji, “Self-cleaning durable adhesives based on electrospun polyvinylidene fluoride fibers,” 5th Molecular Materials Meeting, M3, 3-5 Aug, 2015, Singapore.
* R. Sahay, A. Baji, “Bio-inspired reusable adhesives based on hierarchical electrospun fibers,” The EMN Bangkok Meeting, 10-13 Nov, 2015, Bangkok (*invited speaker*).
* R. Sahay, A. Baji, “Fabrication of biomimetic hierarchical structures using electrospinning combined with template wetting method for dry-adhesive applications,” 6th Global Experts Meeting on Nanomaterials and Nanotechnology, 21-23 April, 2016, Dubai, UAE (*invited speaker*)

**Invited Lecture**

* R. Sahay, “Analysis of flow regions pertaining to electrospinning and applications of electrospun nanofibers,” Visvesvaraya National Institute of Technology (VNIT), Nagpur, Nov 2013.

**Book Chapter**

* Aleksander Góra, **Rahul Sahay**, Velmurugan Thavasi, Seeram Ramakrishna, Encyclopedia of Biomedical Polymers and Polymer Biomaterials, 2015: chapter Melt-Electrospun Fibers, 4449-4467, Taylor & Francis, New York.

**PAtents**

* A. K. Raghav, R. Sahay, "Stealth surface structure with coating for prevention from radar," (applied for Indian patent).
* A. K. Raghav, R. Sahay, "Waste heat utilization system for central heating in automobiles," (applied for Indian patent).

**SCHOLARSHIP AND ACHIEVEMENTS**

* National scholarship (India) in Matriculation for scoring 95% & 92% marks in English & Hindi respectively (1996).
* 98.3 Percentile (All India rank 412) in Graduate Aptitude Test in Engineering (Mechanical engineering 2004).
* Research Scholarship for NUS PhD Program (2006).

**ANALYTICAL SKILLS**

* Programming languages: C++, FORTRAN
* Operating systems: Linux, Windows
* CAE software: AutoCAD, SolidWorks
* CFD softwares : Preprocessors: GAMBIT; Solvers: FLUENT
* Mathematical softwares: MATLAB, Mathematica

**REFERENCES**

* Professor Seeram Ramakrishna,

Mechanical Engineering, National University of Singapore, Singapore

Contact No: 6590107766

Email: [seeram@nus.edu.sg](mailto:seeram@nus.edu.sg)

* Dr. Jayarama Reddy Venugopal, Senior Research Fellow

National University of Singapore, Singapore

Contact No: 6591897371

Email: [jrvgopal@gmail.com](mailto:jrvgopal@gmail.com)

* Dr. A. Sreekumaran Nair

Senior Manager (R&D, MRF Limited, Chennai, Tamil Nadu, India

Contact No: 919544983297

Email: [Sknair.iitm@gmail.com](mailto:Sknair.iitm@gmail.com)