Gurmeet Singh

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Education

August 2016 - August 2018 **M.E. (Thermal Engineering)**

Thapar Institute of Engineering and Technology, Patiala, India
(CGPA of 8.19 on 10 point scale)

Thesis title: ***A computational investigation of magnetic nanoparticle induced hyperthermia using the finite volume method.***
Supervised by: Dr. Neeraj Kumar

August 2010 - August 2014 **B.Tech. (Mechanical Engineering)**

Uttarakhand Technical University, Dehradun, India
(First Division - 62.16%)

Thesis title: ***Development of a working model of hybrid chimney***
Supervised by: Mr. Vinod Kumar

Research Interests

Computational fluid dynamics, Computational heat transfer, Numerical analysis, Computational methods, Scientific computation.

Research Experience

July 2020 – August 2021 **Junior Research Fellow**
Thapar Institute of Engineering and Technology, Patiala, India

Project: ***Computational and experimental investigation for optimizing magnetic nanoparticle hyperthermia***
PI: Dr. Neeraj Kumar
Co - PIs: Dr. B.N. Chudasama,and Dr. Pramod Kumar Avti

Computationally studied nano-fluid flow profiles and concentration distribution in tissues after injection using the Darcy, Brinkman, and species transport equations.

April 2019 - June 2020 **Research Assistant**

Thapar Institute of Engineering and Technology, Patiala, India

Project: ***Magnetic nanoparticle thermotherapy***
P.I.: Dr. Neeraj Kumar

Computationally evaluated the effects of different nanoparticle distribution patterns on hyperthermia efficacy using the bioheat transfer equation.

August 2018 - March 2019 **Junior Research Fellow**
Indian Institute of Technology Ropar, Rupnagar, India

Project: ***Solid tumor targeting using homing peptides and plasmonic photothermal technique.***
P.I.: Dr. Himanshu Tyagi

Computationally modelled plasmonic photothermal technique using the bioheat transfer equation.

Publications

Journal Articles

- ***Singh G.***, Avti P.K., Chudasama B., and Kumar N., "Computational investigation of injection rates and tissue diffusivity on magnetic nanoparticle hyperthermia", Submitted in *Computers in Biology and Medicine*. Manuscript Number: CIBM-D-21-05183.

- ***Singh G.***, Kumar N., and Avti P. K., "Computational evaluation of effectiveness for intratumoral injection strategies in magnetic nanoparticle assisted thermotherapy.", *International Journal of Heat and Mass Transfer*. 2020, vol. 148, pp. 119129. https://doi.org/10.1016/j.ijheatmasstransfer.2019.119129

Book Chapter

Singh G., Kumar N., and Avti P.K., "Bioheat Physics for Hyperthermia Therapy.", In *Application of Biomedical Engineering in Neuroscience*. Springer, Singapore, 2019, pp. 381-397. https://doi.org/10.1007/978-981-13-7142-4_19

Conference Proceedings

- ***Singh G.***, Kumar N., and Avti P.K., "Effects of spatial distribution patterns of magnetic nanoparticles on temperature distribution in magnetic hyperthermia.", *2018 EMF-Med 1st World Conference on Biomedical Applications of Electromagnetic Fields (EMF-Med).* Split, Croatia, 2018, pp. 1-2. https://doi.org/10.23919/EMF-MED.2018.8526038

- ***Singh G.***, and Kumar N., "A numerical analysis of magnetic nanoparticle induced hyperthermia using the finite volume method", *32nd Annual Meeting of the European Society for Hyperthermic Oncology*. Berlin, Germany, 2018.

https://doi.org/10.1007/s00066-018-1295-1

Teaching Experience

January 2017 - August 2018 **Teaching Assistant**
Thapar Institute of Engineering and Technology, Patiala, India

Subjects: ***Engineering Drawing***, ***Engineering Mechanics***.

Tutored classes, conducted and graded tests of undergraduate students.

Academic Awards and Achievements

January 2021 **International English Language Testing System (IELTS), Academic Module Overall Score: 7.5**

Reading: ***9.0***, *Speaking:* ***7.5***, *Writing:* ***7.0***, *Listening:* ***7.0***

July 2020 **TIET - VT (Virginia Tech, USA) Center of Excellence for Emerging Materials (CEEMS), Junior Research Fellowship at Thapar Institute of Engineering and Technology, Patiala, India.**

August 2018 **Department of Bio-Technology, Junior Research Fellowship, at Indian Institute of Technology Ropar, Rupnagar, India.**

August 2016 **All India Council for Technical Education Post Graduate Scholarship for Master's course at Thapar Institute of Engineering and Technology, Patiala, India.**

March 2016 **Qualified Graduate Aptitude Test in Engineering (87th percentile).**

Skills

Programming Languages **C++, MATLAB, Python, Octave**

Modelling and simulation softwares **SolidWorks, COMSOL Multiphysics**

Other tools **Gmsh, GNU Debugger**

Referees

- **Dr. Neeraj Kumar**, Assistant Professor, Department of Mechanical Engineering, Thapar Institute of Engineering and Technology, Patiala, India. neerajkumar@thapar.edu

- **Dr. Pramod Kumar Avti**, Associate Professor, Department of Biophysics, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India. avti.pramodkumar@pgimer.edu.in

- **Dr. Manish Kumar**, Assistant Professor, Department of Mechanical Engineering, Malaviya National Institute of Technology Jaipur, Rajasthan, India. manish.mech@mnit.ac.in