

CURRICULAM VITAE



OBJECTIVE

Seeking a challenging position where I can apply the knowledge that I have learned and to grow in my career with continuous improvement and innovative attitude by acquiring new skills in the field related to my subject of study [CFD (*Computational Fluid Dynamics*)].

PERSONAL PROFILE

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EDUCATION

Dec., 2012, Till date	Asst. Professor Department of Mathematics, Indian Institute of Technology Roorkee, Roorkee, India
July, 2011-Dec, 2012	Lecturer Department of Mathematics, Ravenshaw University, Cuttack, Odisha, India.
November, 2010-June 2011	Post Doctoral Fellow Institute of Computer Physics, (ICP) University of Stuttgart, Germany
August-September-2010	Visiting researcher, Colorado School of Mines, USA
July, 2008-2010	Post Doctoral Fellow Department of Chemical Engineering, NTNU, Norway
July, 2003-February, 2008	Ph.D, Computational Fluid Dynamics, IIT Kharagpur, India
2000-2001	Master of Philosophy

1997-1999	Master of Science in Mathematics, Utkal University, Orissa, India. (Passed with 1st class Distinction)
1994-1997	Bachelor of Science in Mathematics Utkal University, Orissa, India. (Passed with 1st class Honors with Distinction)

AWARDS

2015	DAAD Fellow
2002, 2003	Qualified All India Graduate Aptitude Test in Engineering (GATE).
2001	<i>1st rank</i> in Master of Philosophy, Ravenshaw University, Cuttack, Orissa, India.
1997	<i>1st rank</i> in Bachelor of Science, Utkal University, Orissa, India.

LIST OF PUBLICATIONS

JOURNALS

1. S. Bhattacharyya & A.K. Nayak 2005 Electroosmotic transport in charged micro and nano-channels. Advances in Computational and Experimental Engineering and Sciences (Tech science press), 1753-1759 ISBN 0-9717880-0-6.
2. S. Bhattacharyya & A.K. Nayak 2007 Electroosmotic transport in charged cylindrical micro- and nano-channels. International Journal of Engineering science 45, 55-74.
3. S. Bhattacharyya & A.K. Nayak 2008 Time periodic electro-osmotic transport in a charged micro/nano-channel. Colloids and Surfaces A: Physicochemical and Engineering Aspects. 325 (2008) 152–159.
4. S. Bhattacharyya & A.K. Nayak, 2009 Electroosmotic flow in micro/nanochannels with surface potential heterogeneity: An analysis through the Nernst–Planck model with convection effect. Colloids and Surfaces A: Physicochemical and Engineering Aspects. 339 (2009) 167–177.
5. S. Bhattacharyya & A.K. Nayak, 2010 Combined effect of surface roughness and heterogeneity of wall potential on electroosmosis in micro/nanofluidic channels. Journals of Fluids Engineering. 132, Issue 4 (2010) 041103(11pages) doi:10.1115/1.4001308.

6. A.K. Nayak & S. Bhattacharyya, 2011 Double-diffusive convection in a cubical lid-driven cavity with opposing temperature and concentration gradients. *Theoretical and Computational Fluid Dynamics*. DOI 10.1007/s00162-011-0246-6 (2011).
7. A. K. Nayak, Z. Borka, L. Patruno, F. Sporleder, C.A. Dorao, and H. A. Jakobsen, A Combined Multifluid-Population Balance Model for Vertical Gas-Liquid Bubble Driven Flows Considering Bubble Column Operating Conditions, *Industrial and Engineering Chemistry Research (I&ECR)* 50(3), 2011, 1786-1798.
8. K. R. Rout, J. Solsvik, A. K. Nayak and H. A. Jakobsen, 2011 A Numerical Study of Multicomponent Mass diffusion and Convection in Porous Pellets for the Sorption-Enhanced Steam Methane Reforming and Desorption Processes, *Chemical Engineering Science*, vol: 66, Issue. 18, 4111-4126 (2011).
9. A. K. Nayak & Ashis Kumar Dash, 2011 Numerical Investigation of Thermosolutal Convection in a Cubical Lid-driven Cavity With Opposing Temperature and Concentration Gradients., *International Journal of Fluids Engineering*, 4 (1) (2011), pp. 35-44.
10. A. K. Nayak 2011 Three dimensional Investigation of Fully developed Electroosmotic flows through Nano-channels. *Journal of the Orissa Mathematical Society (JOMS)*, volume-30, 2011, P.80-96.
11. A. K. Nayak 2011 An Analysis of Transient Electroosmotic flows Through Charged Capillaries. *Nanomechanics Science and Technology. An International Journal*, 2(4), 2011, P.1-26.
12. T. Singh, S. K. Sahu, and A. K. Nayak, 2012 An EOQ Model for a Deteriorating Item with Time Dependent Quadratic Demand and Weibull Distribution Deterioration under Permissible Delay in Payment. *Advances in Theoretical and Applied Mathematics*, 7 (3) (2012), pp. 295-307.
13. P. K. Jena & A. K. Nayak, 2012 A numerical investigation of viscous incompressible fluid flow in a square cavity with partially active vertical walls due to Magnetic convection, *International Journal of Applied Mathematics and Computation*, Volume 4(2), 2012, P-164-171.
14. A K Nayak, H B Pattnaik, P K Jena, Numerical investigation of thermosolutal convection in a saturated porous square domain, *Journal of the Orissa Mathematical Society (JOMS)*, (2012) 31 (1), 61-82.
15. T. Singh, S. K. Sahu, and A. K. Nayak, 2012 EOQ Model for a Deteriorating Item with Time Dependent Exponential Demand under permissible delay in payment, *J. Comp. and Mathematical Sciences*, 3 (3), (2012), P-358-369.
16. A. K. Nayak 2013 An Analysis of Steady/Unsteady Electroosmotic flows Through Charged cylindrical nano channel. *Theoretical and Computational Fluid Dynamics* Volume 27, Issue 6, pp 885-902.
17. A. K. Nayak, P. K. Jena, P. A. Lakshmi Narayana 2014 Flow Simulation and Mixed Convection in a Lid-Driven Square Cavity with Saturated Porous Media. *Journal of Porous Media*, Volume 17(6): 537-548.
18. A. K. Nayak 2014 Analysis of Mixing for Electroosmotic flow in micro/nano channels with heterogeneous surface potential. *International Journal of Heat and Mass Transfer*, 75, 135:144.

19. A. K. Nayak, 2014 Enhancement of flow mixing in micro and nano channels. ANZIAM Journal, 55 pp.C47–C63, 2014.
20. N. Maharana, A. K. Nayak, 2015 A comparative study of finite element method for the numerical solution of reaction- diffusion problem, International Journal of Mathematics and Mathematical Sciences (Accepted) .
21. V. Kajjam, A. Nayak, V. K. Katiyar, B. Singh, S. Malik, 2015 Heat transfer effect of cavity ventilation on cold air in thermally insulated vented and unvented wall, Journal of Thermophysics and Heat Transfer, doi 10.2514/1.t4619, AIAA.
22. V. Kajjam, A. Nayak, V. K. Katiyar, B. Singh, Neha Gupta 2015 Thermosolutal mixed convection in an air filled ventilated enclosure with slot wise embedded heat and contaminant sources, Journal of Heat Transfer, 138, 032501-1-9.ASME.
23. Sumit Malik, A. K. Nayak 2016 Buoyancy driven heat transfer in nanofluids due to wall mounted heat source, Alexandria Engineering Journal, Alexandria Engineering Journal, doi:10.1016/j. aej.2016.01.030.
24. Sumit Malik, A. K. Nayak, 2016 Comparative Study of Nanofluid Mixed Convection and Its Effect on Partially Active Thermal Zones in Two Sided Lid-Driven Cavity, Engineering Science and Technology, an International Journal, doi:10.1016/j.jestch. 2016.02.008.
25. A.K. Nayak, S. Malik, K. Venkateshwarlu, P.K. Jena 2016 Magneto-convection and its effect on partially active thermal zones in a porous square domain, International Journal of Heat and Mass Transfer 95 (2016) 913–926.
26. A. K. Nayak, A. Haque, A. Banerjee, B. Weigand, Flow Mixing and Electric Potential Effect of Binary Fluids in Micro/Nano Channels, Colloids and Surfaces A: Physicochemical and Engineering Aspects, 2016, [http://dx.doi.org/ 10.1016/j.colsurfa.2016.10.033](http://dx.doi.org/10.1016/j.colsurfa.2016.10.033).
27. A. K. Nayak, A. Haque, A. Banerjee, 2016, Thermosolutal mixed convection of a shear thinning fluid due to partially active mixed zones within a lid-driven cavity, International Journal of Heat and Mass Transfer. <http://dx.doi.org/10.1016/j.ijheatmasstransfer.2016.09.057>.

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1. A. K. Nayak & S. Bhattacharyya 2004 Three Dimensional Forced Convection in a Cubical Cavity with Opposing Buoyancy Forces. In proc. of CNNA-04, December 8-11, 2004, Indian Institute of Technology Bombay, Powai, India.
2. S. Bhattacharyya & A.K. Nayak 2006 Simulation of Electroosmotic flow in cylindrical capillary slits. In proc. of CFEMATCON-06, July 24-25, 2006, Andhra University, Visakhapatnam, India.
3. A. K. Nayak & S. Bhattacharyya 2007 Three dimensional analysis of Electroosmotic flows through nano-channel. Nominated for “Young Scientist Award Competition (Indian Science Congress Association)” 2007.

4. S. Bhattacharyya & A. K. Nayak 2007 Transient analysis of electro osmotic effects on the liquid flow in a circular nano-channel. In proc. of ICTACEM 2007, December 24-28, 2007, Indian Institute of Technology Kharagpur, Kharagpur, India.
5. S. Bhattacharyya & A. K. Nayak 2008 Flow separation and formation of vortices within a charged Micro and Nanochannel in Electroosmotic Flow. ICNMM-2008, (ASME Conference Paper No.ICNMM2008-62220), Darmstadt, Germany, during June 23-25.
6. A. K. Nayak, Hugo. A. Jakobsen, 2009 Solution of steady diffusion equation by least square spectral method, Gas dynamics conference Trondheim, Trondheim, Norway. During Dec 5-8.
7. A. K. Nayak, Z. Borka, L. Patruno, F. Sporleder, C. A. Dorao, and H. A. Jakobsen, 2010 A Combined Multifluid-Population Balance Model for Bubbly Flows, Proc. of 4th International Conference on Population Balance Modelling September 15-17, 2010, Berlin, Germany.
8. K. R. Rout, A. K. Nayak, M. Hillestad & H. A. Jakobsen 2010 A Numerical Study of Multi Component Mass diffusion and Convection in Porous Pellets for the Methanol Production. AIChE Annual Meeting 2010, USA.
9. K. R. Rout, A. K. Nayak & H. A. Jakobsen 2010 A Numerical study of Multicomponent Mass diffusion and Convection in Porous Pellets for the SE-SMR Process. GLS 2010, Belgium.
10. K. R. Rout, A. K. Nayak, J. Solsvik & H. A. Jakobsen 2010 A comparative study: Numerical Investigation of Multicomponent Mass- and Mole diffusion and Convection in Porous Pellets for the SE-SMR Process. 60th Canadian Chemical Engineering Conference 2010.
11. A. K. Nayak & A. K. Dash, 2010 Numerical Investigation of Thermosolutal Convection in a Cubical Lid-driven Cavity With Opposing Temperature and Concentration Gradients. Orissa Mathematical Society (OMS) proceedings-2010.
12. P. K. Jena & A. K. Nayak, 2012 A numerical investigation of viscous incompressible fluid flow in a square cavity filled with a porous with partially active vertical walls due to Magnetic convection, National Conference on Modeling, Computational Fluid Dynamics & Operations Research February 4-5, 2012 Department of Mathematics Birla Institute of Technology and Science, Pilani.
13. A. K. Nayak, 2012 Three dimensional Investigation of Fully Developed Electroosmotic flows through nanochannels, National Conference on Modeling, Computational Fluid Dynamics & Operations Research February 4-5, 2012 Department of Mathematics Birla Institute of Technology and Science, Pilani.
14. A. K. Nayak & P. K. Jena, Mixed Convection in a saturated porous Mixed Convection in a saturated porous square domain. NCIMSC- 12- 104, National conference on Industrial Mathematics and soft Computing-2012.
15. A. K. Nayak, Enhancement of flow mixing in micro and nano channels, EMACS 2013, Brisbane, Australia.
16. A. K. Nayak & Sumit Malik, Numerical study of mixed convection cooling of heat source mounted in lid driven cavity filled with nano-fluid, International conference on Mathematical Modeling and computer simulation, Dec. 8-10, 2014, IIT Madras.

17. M. Parida, A. K. Nayak 2014 A Numerical investigation of Blood flow in an arterial segment with periodic body acceleration, ICRTMAA-2014, Mathematical Analysis and its Applications, 489-499, DOI: 10.1007/978-81-322-2485-3_40.
18. N. Maharana, A. K. Nayak 2014 A least-squares finite element method with direct minimization for convection-dominated problems, ICIMSC14/OMS41/65, ICIMSC-2014.
19. M. Parida, A. K. Nayak 2014 A computational study of pulsatile blood flow and heat transfer through an artery in the presence of body acceleration, ICIMSC14/OMS41/66, ICIMSC-2014.
20. S. Malik, A. K. Nayak, Mixed convection and heat transfer effects in a two sided lid driven enclosure filled with nano-fluid due to discrete heat sources, 2ND BI-ANNUAL CONFERENCE OF JSMS-2015 during November 21-23, 2015.
21. A. K. Nayak, P. K. Jena, A. Haque, Double diffusive mixed convection effect of non-Newtonian fluid in a cubical enclosure, 2ND BI-ANNUAL CONFERENCE OF JSMS-2015 during November 21-23, 2015.
22. N. Gupta, A. K. Nayak, Numerical investigation of mixed convection in a ventilated enclosure due to contaminant(CO₂) sources, 2ND BI-ANNUAL CONFERENCE OF JSMS-2015 during November 21-23, 2015.
23. A. K. Nayak, Combined effect of Tip wall distance and Heterogeneity of wall potential on electroosmotic flow within a charged Micro and nano-channel, **ICMF-2016** – 9th International Conference on Multiphase Flow, May 22nd – 27th 2016, Firenze, Italy.
24. Malik, Sumit, and A. K. Nayak, Numerical Study of Heat Transfer and Entropy Generation in a Nanofluid Filled Two-Sided Lid-Driven Cavity, Istanbul commerce university (2016): 151.
25. N. Gupta, A. K. Nayak, Buoyancy driven heat transfer effect in room ventilation due to discrete heat sources, Sixth International Congress on Computational Mechanics and Simulation, 27 june-1 july, 2016, IIT Bombay.

BOOK CHAPTERS

1. Solution of Steady diffusion-equation by LSQ Method. Hugo. A. Jakobsen, **A. K. Nayak**. Chemical Reactor Modelling: Multiphase Reactor Flows. Springer Edition.
 2. Combined Multifluid-Population Balance model for Bubbly Flows ,Hugo. A. Jokobsen, A. K. Nayak, Chemical Reactor Modelling.
 3. Hydrogen from Natural Gas, M. Shah, P. Mondal, **A. Nayak**, A. Bordoloi, Sustainable Utilization of Natural Resources, CRC Press, Taylor & Francis Group.
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