

Curriculum vitae



1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION								
Surname	Mahdavi		First names	Mostafa				
Residency	Permanent Residence Holder, South Africa		Postal Address	Dep. of Mech. and Aeronautical Eng., University of Pretoria, Lynnwood Road Hatfield, Pretoria 0002, South Africa				
Country	South Africa		Title	Dr	Female	<input type="checkbox"/>	Male	<input checked="" type="checkbox"/>
Institution	University of Pretoria Department of Mechanical & Aeronautical Engineering		Position	Senior lecturer - Permanent				
Direct Telephone	0027-616305955		Fax	0027 (0)12 420 6632				
E-mail	m.mahdavee@gmail.com - mostafa.mahdavi@up.ac.za							
Date of appointment	January 2022		Period					

1.2 ACADEMIC QUALIFICATIONS OBTAINED				
Degree/ Diploma	Field of study	Higher education institution	Year of completion	Distinctions
PhD	Mechanical Engineering	University of Pretoria	2017	Yes
MEng	Mechanical Engineering	University of Shiraz	2010	Yes
BEng	Mechanical Engineering	Sari Azad University	2007	No

1.3 WORK EXPERIENCE TO DATE		
Name of employer	Capacity and/or type of work	Period
University of Pretoria	Senior lecturer	Jan 2022 - Present
Ubiquetherm – New Zealand	CFD consultant	Jan 2021 - Present
University of Pretoria	Postdoc	Jan 2020 – Dec 2021
COENG consulting company	Project Engineer	July 2018 – July 2019
University of Pretoria	Postdoc	Feb 2017 – Dec 2018

1.4 Academic Projects and supervisors
<p>PhD: University of Pretoria, department of mechanical and aeronautical engineering (2013-2017). Thesis Title: Study of flow and heat transfer features of nanofluids using multiphase models: Eulerian multiphase and discrete Lagrangian approaches Supervisor: Prof Sharifpour and Prof Josua Meyer</p> <p>M. Eng., Mechanical Engineering- Energy Conversion (2007-2010) Department of Mechanical engineering, school of Mechanical, engineering, Shiraz University, Shiraz, Iran Thesis Title: Experimental and numerical study of natural frost formation over a horizontal finned tube Thesis mark: 19.31/20 or 96.5/100 Supervisor: Prof. Mahmood Yaghoubi.</p> <p>B. Eng., Mechanical Engineering (2003-2007). Department of Mechanical engineering, Islamic Azad University, Sari, Mazandaran, IRAN Project Title: Designing of Air Conditioning system in a High-rise Hotel. Supervisor: Prof. Abbasi.</p>

2. INDUSTRIAL PROJECTS

2.1 Project Designer and Engineer	
Offloading Hydraulics Analysis And Calculations For Pumps	
Responsibility:	Project Senior Engineer, Project Manager, Project Report Provider
Client:	VFP FUELLING/PARKER
Location:	Moatize, Mozambique
Date:	August 2018
Status:	Completed
Supply, Installation, Testing and Commissioning of Sunlight Dish Washing Liquid (SDWL) Plant	
Responsibility:	Project Piping Engineer, Project Engineer, Project Planner, Procurement
Client:	UNILEVER, South Africa

Location:	Harare, Zimbabwe
Date:	July 2018 – Feb 2019
Status:	Completed
Offloading Line Backflow Failure Mode Studies	
Responsibility:	Project Senior Engineer, Project Manager, Project Report Provider
Client:	SHELL
Location:	SHELL DEPOT Nelspruit, South Africa
Date:	May 2019
Status:	Completed
Spent Grain Silos Design And Replacement - EPC contract	
Responsibility:	Project Engineer, Project Planner, Procurement
Client:	SAB Alrode (ABInBev) -
Location:	Alrode, South Africa
Date:	Aug 2018 – June 2019
Status:	Completed
Procurement, Installation, Testing And Commissioning Of Nitro Plant	
Responsibility:	Project Engineer, Project Planner, Procurement Engineer
Client:	SASOL
Location:	Secunda, South Africa
Date:	My involvement (May 2019 – July 2019)
Status:	Completed on Dec 2019

3. TEACHING ACTIVITIES

3.1 Courses presented		
Course	Level (e.g. second year, Masters)	Self developed (Yes or No)
Programming and Data Proc MPR213	Second year (2022 1 st semester)	No
Computational Fluid Dynamics MKM411	Fourth year (2022 2 nd semester)	No

3.2 Other education and pedagogic courses presented		
Course	Year	Institution
Finite Volume in CFD	2018	University of Pretoria – Funded by Imperial

		College London
Multiphase flows	2019	University of Pretoria – Funded by Imperial College London

4. TEACHING OUTPUTS

4.1 Academic/review experience

- Internal examiner of several Master and PhD students' final projects at University of Pretoria
- 1. Reviewer of several papers from different international journals

5. POSTGRADUATE SUPERVISION

5.1 Supervision or co-supervision of students who have completed degrees

Name of student	Degree ¹ /Title of dissertation/ thesis and date completed	Supervisor	Co-supervisor(s)	Duration of studies (years)

5.2 Current post-graduate students

Name of student	Degree ² enrolled for and date of first registration	Project title	Supervisor	Co-supervisor(s)	Year of registration

¹ Indicate whether Honours, Masters research, Masters coursework with dissertation or Doctorate

² Indicate whether Honours, Masters research, Masters coursework with dissertation or Doctorate

5. RESEARCH ACTIVITIES

5.1 RESEARCH AREA

- Natural convection
- Frost formation in heat exchangers
- Air conditioning design – heating and cooling
- Heat and mass transfer
- Fluid flows and computational fluid dynamic (CFD), Laminar, Transient and Turbulent
- Mixed convection flows modeling and analysis
- Modeling and experimental studies of nanofluid in tubes and cavities
- Multiphase modeling in VOF and mixture flow fields
- Particulate systems, aerosol and solid-liquid discrete phase analysis
- Boiling, evaporation and condensation: spray and jet cooling, pool boiling, flow boiling, etc.
- Porous media
- Ventilation and energy analysis of domestic and industrial buildings

5.2 RESEARCH OUTPUTS

5.2.1 Publications in peer-reviewed or refereed journals

1. Mostafa Mahdavi, Mohsen Sharifpur, Hikmet S. Aybar, Mohammad Hossein Ahmadi, Ali J. Chamkha, Maged Faihan Alotaibi and Josua P. Meyer (2021), Thermal boundary condition analysis of cooling objects exposed to free impinging jet by using headline conception, *Engineering Applications of Computational Fluid Mechanics*, Volume 15, NO. 1, 1919-1931.
DOI: <https://doi.org/10.1080/19942060.2021.1997825>
2. Mostafa Mahdavi, Mohsen Sharifpur and Josua P. Meyer (2021), Impact of micro-fins on a heated cylinder submerged in a nanofluid saturated medium. *International Journal Heat and Mass Transfer*, Volume 177, 121551.
DOI: <https://doi.org/10.1016/j.ijheatmasstransfer.2021.121551>
3. Mostafa Mahdavi, Mohsen Sharifpur and Josua P. Meyer (2020), Nanofluid flow and shear layers between two parallel plates: a simulation approach. *Engineering applications of computational fluid mechanics*, Volume 14, NO. 1, 1536–1545.
DOI: <https://doi.org/10.1080/19942060.2020.1844806>
4. Mostafa Mahdavi, Mohsen Sharifpur and Josua P. Meyer (2020), Fluid flow and heat transfer analysis of nanofluid jet cooling on a hot surface with various roughness. *International Communications in Heat and Mass Transfer*, Volume 118, pages 104842.

DOI: <https://doi.org/10.1016/j.icheatmasstransfer.2020.104842>

5. Mostafa Mahdavi, Mohsen Sharifpur, Josua P Meyer, Lingen Chen (2020), Thermal analysis of a nanofluid free jet impingement on a rotating disk using volume of fluid in combination with discrete modeling. *International Journal of Thermal Sciences*, vol. 158, 106532.
DOI: <https://doi.org/10.1016/j.ijthermalsci.2020.106532>
6. M. Mahdavi, I Garbadeen, M. Sharifpur and J.P. Meyer (2019), Study of particle migration and deposition in mixed convective pipe flow of nanofluids at different inclination angles, *Journal of Thermal Analysis and Calorimetry*, vol. 135, pp. 1563–1575.
DOI: <https://doi.org/10.1007/s10973-018-7720-y>
7. M. Mahdavi, M. Sharifpur, Mohammadhosein Ahmadi and J.P. Meyer (2019), Aggregation study of Brownian nanoparticles in convective phenomena, *Journal of Thermal Analysis and Calorimetry*, vol. 135, pp. 111–121.
DOI: <https://doi.org/10.1007/s10973-018-7283-y>
8. E.J. Onyiriuka, Al. Obonor, M. Mahdavi, DRE. Ewim, (2018), Evaluation of single-phase, discrete, mixture and combined model of discrete and mixture phases in predicting nanofluid heat transfer characteristics for laminar and turbulent flow regimes. *Advanced Powder Technology*, vol. 29, pp. 2644-2657.
<https://doi.org/10.1016/j.appt.2018.07.013>
9. M. Mahdavi, M. Sharifpur, and J.P. Meyer (2018), Exploration of nanofluid pool boiling and deposition on a horizontal cylinder in Eulerian and Lagrangian frames, *International Journal Heat and Mass Transfer*, vol. 125, pp. 959–971
<https://dx.doi.org/10.1016/j.ijheatmasstransfer.2018.04.153>
10. M. Mahdavi, M. Sharifpur, H. Ghodsinezhad and J.P. Meyer, (2018), Experimental and numerical investigation on a water-filled cavity natural convection to find proper thermal boundary conditions for simulation, *Journal of heat Transfer engineering*, vol. 39, Issue 4, pp. 359-373,
DOI: <http://dx.doi.org/10.1080/01457632.2017.1305835>
11. M. Mahdavi, M. Sharifpur and J.P. Meyer (2018), Discrete modelling of nanoparticles in mixed convection flows, *Journal of Powder Technology*, vol 338, PP. 243–252.
<https://doi.org/10.1016/j.powtec.2018.07.025>
12. M. Mahdavi, M. Sharifpur and J.P. Meyer (2017), A novel combined model of discrete and mixture phases for nanoparticles in convective turbulent flow, *Physics of Fluids*, Vol. 29, 082005
<http://dx.doi.org/10.1063/1.4998181>
13. M. Mahdavi, M. Sharifpur, H. Ghodsinezhad and J.P. Meyer, (2017) A new combination of nanoparticles mass diffusion flux and slip mechanism approaches with electrostatic forces in multiphase Mixture model, *International Journal of Heat and Mass Transfer*, vol. 106, 980-988
<http://dx.doi.org/10.1016/j.ijheatmasstransfer.2016.10.065>
14. M. Mahdavi, M. Sharifpur, H. Ghodsinezhad and J.P. Meyer, (2016) Experimental and numerical study on thermal and hydro-dynamic characteristics of laminar natural convective flow inside a rectangular cavity with water, EG-water and air, *Experimental Thermal and Fluid Science*, vol. 78, 50-64.
<http://dx.doi.org/10.1016/j.expthermflusci.2016.04.029>
15. M. Mahdavi, M. Sharifpur and J.P. Meyer, (2016) Simulation study of convective and hydrodynamic turbulent nanofluids by turbulence models, *International Journal of Thermal Sciences*, vol. 110, 36–51

<http://dx.doi.org/10.1016/j.ijthermalsci.2016.05.027>

16. M. Mahdavi, M. Sharifpur and J.P. Meyer, (2016) Implementation of diffusion and electrostatic forces to produce a new slip velocity in multiphase approach of nanofluids, Journal of Powder Technology.307, Pages 153–162.
<http://dx.doi.org/10.1016/j.powtec.2016.11.032>
17. M. Mahdavi, M. Sharifpur and J.P. Meyer, (2015) CFD modelling of heat transfer and pressure drops for nanofluids through vertical tubes in laminar flow by DPM and Mixture model, International Journal of Heat and Mass Transfer, vol. 88, 803-813
DOI: <http://dx.doi.org/10.1016/j.ijheatmasstransfer.2015.04.112>
18. M. Yaghoubi, M. Mahdavi, (2013) An investigation of natural convection heat transfer from a horizontal cooled finned tube. J. Experimental Heat Transfer, Volume 26, Issue 4, pages 343-359.
DOI: <http://dx.doi.org/10.1080/08916152.2012.669809>
19. M. Mahdavi, M. Yaghoubi, (2012) Experimental study of natural frost formation over a horizontal tube with annular compact fins under natural convection condition. J. Heat Transfer - Asian Research (2012). Volume 41, Issue 1, pages 84–98. DOI: 10.1002/htj.20397

5.2.2 Chapter books

1. M. Mahdavi, M. Sharifpur and J.P. Meyer (2019), Solid-liquid two-component flow: discrete phase and mixture approaches for nano-scale heat transfer, Handbook of Multiphase Flow Science and Technology, Book chapter, Springer.
Site: <http://link-springer-com-443.webvpn.fjmu.edu.cn/referencework/10.1007%2F978-981-4585-86-6#toc>

5.2.3 Accepted/under review paper

1. Mostafa Mahdavi, Mohsen Sharifpur, Hikmet S. Aybar, Mohammad Hossein Ahmadi, Rani Taher and Josua P. Meyer, Correlation study of nanofluid flow merging points in entrance region, International Communications On Heat & Mass Transfer, 2021, ICHMT-D-21-01802.

5.2.4 Published full-length conference papers (peer-reviewed)

1. M. Mahdavi, M. Sharifpur and J.P. Meyer, Nanofluid Jet Flow Cooling On A Dynamic Hot Circular Disk, 15th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2021), July 26-28, 2021, Virtual Conference.
2. Marilize Everts, Mostafa Mahdavi and Josua P. Meyer, hydrodynamic and thermal boundary layers for mixed convective laminar flow in horizontal tubes. ICHMT International Symposium on Advances in Computational Heat Transfer, August 16 - 20, 2020, Rio de Janeiro, Brazil (paper accepted).
3. M. Mahdavi, M. Sharifpur and J.P. Meyer, Nanofluid pool boiling and deposition on a cylinder, 13th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics), 17 -19 July 2017, Portorož, Slovenia.

4. M. Sharifpur, M. Mahdavi and J.P. Meyer, Computational fluids dynamics simulation to predict vacuum infusion process, the 5th International Conference on Composites: Characterization, Fabrication and Application (CCFA-5), Dec. 20-21, 2016, Tehran, Iran.
5. M. Mahdavi, M. Sharifpur and J.P. Meyer, Natural Convection Study of Brownian Nano-Size Particles Inside a Water-Filled Cavity by Lagrangian Tracking Approach, 12th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2016), July 11-13, 2016, Costa del Sol, Malaga, Spain.
6. M. Mahdavi, M. Sharifpur and J.P. Meyer, Development of a novel method for slip velocity of fluid structure interactions by employing effects of electrostatic attraction on the surface of nanoscale particles, The Sixth International Conference on Structural Engineering, Mechanics and Computation (SEMC 2016), 5 - 7 September 2016, Cape Town, South Africa.
7. M. Mahdavi, Hadi Ghodsinezhad, M. Sharifpur and J.P. Meyer, Boundary Condition Investigation for Cavity Flow Natural Convection, 11th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2015), July 20-23, 2015, Kruger National Park, South Africa.
8. M. Mahdavi, M. Sharifpur and J.P. Meyer, Comparative study on simulation of convective Al₂O₃-water nanofluid by using ANSYS-FLUENT, The 15th International Heat Transfer Conference (IHTC-15), August 10-15, 2014, Kyoto, Japan.
9. M. Sharifpur, M. Mahdavi and J.P. Meyer, CFD Simulation to find Porous Multilayer Limitation of the Vacuum Infusion Process, The 4th International Conference on Composites: Characterization, Fabrication and Application (CCFA-4), Dec. 16-17, 2014, Tehran, Iran.
10. M. Mahdavi, Mahmood Yaghoubi, Kamran Hirbodi. Mechanism of Frost Formation and Growth over a Compact Finned-tube. 2nd Iranian Conference on Heat and Mass Transfer-ICHMT2014, 19-20 November 2014, Faculty of Mechanical Engineering, Semnan University, Semnan, Iran.
11. M. Mahdavi, M. Yaghoubi, "An Empirical Investigation of Frost Formation from Finned Tubes in Cooling and Industrial Units". 2nd International Conference on Industrial Ventilation and Health (Persian), 2011, Sharif University, Tehran, Iran.
12. M. Mahdavi, M. Yaghoubi, "Experimental Study of Natural Frost Formation over a Horizontal Finned Tube". 13th Annual and 2nd International Fluid Dynamics Conference, 2010, Shiraz, Iran.

6. PROFESSIONAL SKILLS

6.1 Computer Skills:

Programming Languages: **Fortran, MATLAB**

Engineering Software: **FLUENT** (expert user of UDF), **ANSYS, AutoCAD, StarCCM+, Carrier HAP 4.5, Revit MEP** and **Revit Architectural, Flovent, AFT FATHOM, Microstation, PDMS** (Admin, Design, Database, Drafting, Isodraft)

General Software: Microsoft Office, Tecplot and similar visualization software tools, and familiar with 3Ds Max, Photoshop.

Technical software:

Ansys Fluent and UDF programming: I have been working with Ansys modeling and designing in CFD for a long time. Some fields are multiphase flows, particulate flows, heat and mass transfer, heat exchangers etc. Also, I am an expert user

of User Defined Function (UDF) and programming of C++ in Ansys Fluent.

AutoCAD (2D and 3D), **Carrier HAP 4.5**: I worked with this software to accomplish some projects for my undergrad and master degrees. Particularly, I designed HVAC system for a high story building via AutoCAD (2D and 3D) and Carrier HAP 4.5 as a part of my undergrad final project.

Revit MEP and Revit Architectural: I am familiar with mechanical (HVAC) and architectural designs to some extent.

FloVent: I used this CFD tool to conduct energy and heat transfer analyses in a data center as a part of a research project.

PDMS: Expert user of PDMS for piping 3D modeling, 2D drafting and Iso-drawing, in any industries from petroleum to hygienic systems.

AFT FATHOM: Expert user to model hydraulic systems in steady and transient conditions.

Microstation: I am familiar with this software to some extent.

7. RESEARCH FUNDING

7.1 Obtaining research funds <i>(Optional)</i>			
Origin of research funds <i>(e.g. contract research, THRIP, international funding organisations, other(s))</i>	Title of research project or programme	Duration	Money allocated (R) <i>(Optional - exact amounts not required)</i>

8. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

8.1 Participation in conferences, workshops and short courses - specify type of contribution
<i>Provide full details of participation in national and international conferences etc</i>
<i>8.1.1 National</i>
<i>8.1.2 International</i>

8.2 Teamwork and collaboration with others:

Other researchers (national and international)

Other research institutions (national and international)

Industry

8.3 Membership in national and international bodies

List all the scientific associations or societies to which you belong. Name your involvement, e.g. honorary member, founder member, full member, chairman, president, secretary

8.4 Visits to local and overseas universities or research institutes as guest professor or researcher

Details are required

9. ARTISTIC OUTPUTS (if applicable)

9.1 Provide full details of artistic outputs, including public reviews of work, coordinating reports by experts in the field, publisher, production company etc

10. MANAGEMENT AND ADMINISTRATIVE DUTIES

10.1 List your involvement in departmental activities (e.g. administrative functions), faculty (e.g. Faculty Committees) or other university activities.

11. COMMUNITY SERVICE OR PROFESSIONAL SKILLS

11.1 Outreach projects

(e.g. project titles, institutions and communities involved, etc.)

11.2 Professional service performed

(e.g. courses presented, lectures at professional associations/clubs, radio or TV)

appearances, outside expert or appointment committee, etc.)

11.3 Clinical service

(e.g. full detail of rank/level of joint appointment, level of clinical service rendering responsibilities, university administration and academic responsibilities, CPD involvement, clinical trials involvement, etc.)

11.4 Involvement with other universities/scientific institutions

(e.g. external examiner, editor of journal, advisory council, CSIR, SA Council for Scientific Professions)

11.5 Referee duties

(e.g. journals, dissertations/theses)

12. AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

12.1 Evaluation status as scientist/scholar

(e.g. NRF; first evaluation and date, subsequent evaluations and dates)

12.2 Research awards and prizes

Full details are required

12.3 Teaching awards and prizes

Full details are required

12.4 Artistic awards and prizes

Full details required

ORCID iD

<https://orcid.org/0000-0002-0944-0067>

Web-link:

Google scholar

<https://scholar.google.com/citations?user=iYDOINQAAAAJ&hl=en>

Linkedin:

www.linkedin.com/in/mostafa-mahdavi-97a38653