

UNIVERSITY OF PRETORIA

CURRICULUM VITAE

1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION

Surname	MAHMOOD	First names	GAZI IFTEKHAR				
Citizenship	BANGLADESHI / CANADIAN	Title	DR.	Female		Male	X
Present Employer & Department	University of Pretoria (S. Africa), Mechanical & Aeronautical Engineering Department	Position	SENIOR LECTURER				
Direct Telephone	+27 12 420-6822	Direct Telefax	+27 12 420-6822				
E-mail	Gazi.Mahmood@up.ac.za ; Alternately: mahmood.gazi@gmail.com						
Date of appointment	18-February-2013	Permanent full-time	X	Temporary full-time			

1.2 ACADEMIC QUALIFICATIONS OBTAINED

Degree	Field of study	Higher education institution	Year
Ph.D.	Mechanical Engr.	Univ. of Utah, Utah, USA	2001
M.Engr.	Mechanical Engr.	City Univ. of New York, USA	1997
B.Tech.	Mechanical Engr.	Indian Inst. Of Technology, Bombay, India	1995

1.3 WORK EXPERIENCE TO DATE

Name of employer	Capacity and/or type of work	Period From mm//yy to mm//yy
Univ. of Pretoria, South Africa	Senior Lecturer (Mech. & Aero. Engr.)	Feb 2013 – Present
Venmar CES, Saskatoon, Canada	R&D Design Engineer	April 2012 – Dec 2012
Univ. of Saskatchewan, Canada	Research Engineer (Mech. Engr.)	Jan 2009 – Dec 2011
Univ. of Pretoria, South Africa	Senior Lecturer (Mech. & Aero. Engr.)	Mar 2007 – Nov 2008
Univ. of Wyoming, USA	Postdoc Researcher (Mech. Engr.)	Jan 2006 – Dec 2006
Univ. of Louisiana, USA	Postdoc Researcher (Mech. Engr.)	May 2002 – Dec 2005
Columbia Univ. of New York, USA	Lecturer (Mech. Engr.)	Jan 2001 – Dec 2001
KSB Pumps, Inc., India/Bangladesh	Trainee Engineer	July 1995 – July 1996

2. TEACHING ACTIVITIES

2.1 Courses presented		
Course	Level	Self developed (Yes or No)
Aerodynamics	4 th Yr. undergraduate, Univ. of Utah (1999)	Yes
Mechanical Engr. Lab 3	3 rd Yr. undergraduate, Columbia Univ. (2001)	Yes
Mechanical Engr. Lab 4	4 th Yr. undergraduate, Columbia Univ. (2001)	Yes
Advanced Fluid Mechanics	Postgraduate, Columbia Univ. (2001)	Yes
Advanced Heat Transfer	Postgraduate, Columbia Univ. (2001)	Yes
Thermal Machines	4 th Yr. undergraduate, Univ. of Pretoria (2007, 2008)	Yes
Fluid Machines	4 th Yr. undergraduate, Univ. of Pretoria (2007, 2008)	Yes
Thermal & Fluid Machines	4 th Yr. undergraduate, Univ. of Pretoria (2013- Present)	Yes
Thermoflow	Postgraduate, Univ. of Pretoria (2014, 2015)	In cooperation with Dr. S Mohsen
Fluid Mechanics	Postgraduate, Univ. of Pretoria (2014- Present)	Yes
Advanced Fluid Mechanics	Postgraduate, Univ. of Pretoria (2017- 2018)	Yes

3. RESEARCH ACTIVITIES

3.1 Former supervision or co-supervision (completed)				
Name of student	Degree/Title of dissertation/ thesis and date	Supervisor	Co-supervisor(s)	Duration of studies (years)
Bronwyn C. Meyers	M.Eng., Exp. Flow field & thermal meas. in can type combustor, 2010 (UP).	Gazi I. Mahmood	Josua Meyer, G. Sneden	Two
Khizir Mahmud	M.Sc., Performance meas. run-around membrane energy exchanger, 2009 (U Sask).	Carey Simonson	Gazi Mahmood, Robert Besant	Two
Hiren Patel	M.Sc., VOC transfer meas. in run-around membrane energy exchanger, 2012 (U Sask).	Carey Simonson	Gazi Mahmood, Robert Besant	Two
Keenesh Arnachellan	MEng, Aerodynamic loss reduction in a vane cascade with fillet and film cooling, 2017 (U Pretoria).	Gazi I. Mahmood	Josua Meyer	Two

Louis Cramer	MEng, Enhancement of Thermal performance of Solar Heat Exchangers with porous Inserts, 2018 (U Pretoria).	Gazi I. Mahmood	Josua Meyer	Two
Andrew Torr	MEng, Thermofluid performance of channel with wavy porous screen , 2019 (U Pretoria).	Gazi I. Mahmood	Josua Meyer	Two
Adeola Shote	PhD, Aerodynamics and endwall heat transfer in a vane cascade with fillet and film cooling, 2019 (U Pretoria).	Gazi I. Mahmood	Josua Meyer	Four
Dirk Human	MEng, Performance prediction of multi-stage centrifugal compressor, 2020 (U Pretoria).	Gazi I. Mahmood	Johan van der Spuy	Two
Zimase DLamini	MEng, Film-cooling performance of diffused cylindrical holes, 2021 (U Pretoria)	Gazi I. Mahmood		Two

Name of student	Degree enrolled	Project title	Supervisor	Status
Aasa Samson	PhD	Thermofluid performance of grooved & corrugated channel	Gazi Mahmood	Thesis under examination
Barbara Huysen	PhD	Vane cascade aerodynamics with fillet & film cooling	Gazi Mahmood	Continue
Stephen Roux	PhD	Thermofluid performance of pin-fin channels	Gazi Mahmood	Continue
Frans Coetzee	MEng	Thermal performance of air channel with cylindrical cross-bars	Gazi Mahmood	Thesis under examination

4. RESEARCH OUTPUTS

4.1 Publications in peer-reviewed or refereed journals

(1) Roux S.M., **Mahmood G.I.**, and Meyer J.P., "EFFECT OF SIDEPIPS ON THE THERMOHYDRAULIC CHARACTERISTICS OF AN ARRAY OF INTERNAL PIN-FINS," Heat Transfer Research, 51(9), pp. 879-895, 2020. DOI: 10.1615/HeatTransRes.2020030239.

(2) Torr A., **Mahmood G.I.**, and Cramer L., "Heat Transfer-Friction Factor and Correlations for Wavy Porous Screens as Inserts in Channel Thermal Performance," ASME J. Thermal Science Eng Applications, vol. 12, 0510011-05100111, 2020. DOI : 10.1115/1.4045883.

(3) Shote S.A., **Mahmood G.I.**, and Meyer J.P., "Influences of large fillets on endwall flows in a vane cascade with upstream slot film-cooling," Exp Therm Fluid Sciences, Vol. 112, 01 April 2020, 109951. doi.org/10.1016/j.expthermflusci.2019.109951.

(4) Cramer L., **Mahmood G.I.**, and Meyer JP, "Thermohydraulic Performance of a Channel Employing Wavy Porous Screens," paper no. HTR-25337, Heat Transfer Research, Vol. 49 (18), pp. 1867-1883, 2018. DOI: 10.1615/HeatTransRes.2018025337.

(5) **Mahmood G.I.** and Arnachellan K, "Effects of Upstream Endwall Film-cooling on a Vane Cascade Flow-field," manuscript no. 2017-02-B36640, AIAA J. Propulsion and Power, 2018, Vol. 34 (2), pp. 460-468. doi: 10.2514/1.B36640, ISSN 0748-4658 (print) or 1533-3876.

(6) Pretorius HJ., **Mahmood G.I.**, and Meyer JP., "Static pressure characteristics in a pin-fin channel with shaped cylindrical pins," paper number," ASME J. Fluid Engineering, 2017, Vol. 39, pp. 0911041-0911045, doi: 10.1115/1.4036671.

(7) **Mahmood, G.I.**, Simonson, C., and Besant, R.W., "Experimental Pressure Drop and Heat Transfer in a Rectangular Channel with a Sinusoidal Porous Screen," ASME J. Heat Transfer, Vol. 137(042601), pp. 1-11. APRIL, 2015.

- (8) Ge G., **Mahmood G.I.**, Moghaddam D.G., Simonson C.J., Besant R.W., Hanson S., Erb B., Gibson P.W., "Material Properties and Measurements for Semi-permeable Membranes Used in Energy Exchangers," J. Membrane Science, Vol. 453, pp. 328-336, 2014.
- (9) Meyers B.C., Snedden G.C., Meyer J.P., Roos T.H., **Mahmood, G.I.**, "Three-component Particle Image Velocimetry in a Generic Can-type Gas Turbine Combustor," IMechE J. Power Energy, 226(7), 2012, pp. 892-906.
- (10) Mahmud, K., **Mahmood, G.I.**, Simonson, C., and Besant, R.W., "Performance testing of counter cross-flow run-around membrane energy exchanger (RAMEE) system for HVAC applications," J. Energy & Buildings, Vol. 42, 2010, pp. 1139–1147.
- (11) Vali, A., Simonson, C.J., Besant, R.W., **Mahmood., G.I.**, "Numerical Model and Effectiveness Correlations for a Run-Around Heat Recovery System with Combined Counter and Cross Flow Exchangers," Intl J. Heat Mass Transfer, Vol. 52, 2009, pp. 5827–5840.
- (12) **Mahmood, G.I.** and Acharya, S., " Experimental Investigation of Secondary Flow Structure in a Blade Passage With and Without Leading Edge Fillets", ASME Trans. J. Fluids Engineering, v. 129, No. 3, pp. 253-262, 2007.
- (13) **Mahmood, G.I.**, Gustafson, R., and Acharya, S., "Experimental Investigation of Flow Structure and Nusselt Number in a Low Speed Linear Blade Passage With and Without Leading Edge Fillets", ASME Trans. J. Heat Transfer, Vol. 127, pp. 499-512, 2005.
- (14) Acharya, S., Zhou, F., Lagrone, J., **Mahmood, G.I.**, and Bunker, R.S., "Latticework (Vortex) Cooling Effectiveness: Rotating Channel Experiments", accepted for publication, ASME Journal of Turbomachinery, vol. 127, no.3, pp.471-478, JUL 2005.
- (15) Won, S.Y., **Mahmood, G.I.**, and Ligrani, P.M., "Spatially-Resolved Heat Transfer and Flow Structure in a Rectangular Channel With Pin Fins," International Journal of Heat and Mass Transfer, 47 (8-9), pp.1731-1743, APR 2004.
- (16) Ligrani, P.M. and **Mahmood, G.I.**, "Variable Property Nusselt Numbers in a Channel With Pin-Fins", AIAA Journal of Thermophysics and Heat Transfer, Vol. 17, No.1, 2003, pp. 103-111.
- (17) Won, S.Y., **Mahmood, G.I.**, and Ligrani, P.M., "Flow Structure and Local Nusselt Number Variations in a Channel with Angled Crossed-Rib Turbulators", International Journal of Heat and Mass Transfer, 46 (17), pp.3153-3166, AUG 2003.
- (18) **Mahmood, G.I.**, Ligrani, P.M., and Chen, K., "Variable Property and Temperature Ratio Effects on Nusselt Numbers in a Rectangular Channel with 45 deg Angled Rib Turbulators", ASME Transactions- Journal of Heat Transfer, 125 (5), pp.769-778, OCT 2003.
- (19) Ligrani, P.M. and **Mahmood, G.I.**, "Spatially-Resolved Heat Transfer and Friction Factors in a Rectangular Channel with 45 deg Angled Rib Turbulators", ASME Transactions-Journal of Turbomachinery, 125(3), pp.575-584, JUL 2003.
- (20) **Mahmood, G.I.** and Ligrani, P.M., "Heat Transfer in a Dimpled Channel: Combined Influences of Aspect Ratio, Temperature Ratio, Reynolds Number, and Flow Structure," International Journal of Heat and Mass Transfer, 2001.
- (21) Ligrani, P.M., Harrison, J.L., **Mahmood, G.I.**, and Hill, M.L., "Flow Structure Due to Dimple Depressions on a Channel Surface," Journal of Physics of Fluids, Vol. 13, No.11, November 2001.
- (22) Ligrani, P.M., **Mahmood, G.I.**, Harrison, J.L., Clayton, C.M., and Nelson, D.L., "Flow Structure and Local Nusselt Number Variations in a Channel With Dimples and Protrusions on Opposite Walls," International Journal of Heat and Mass Transfer, 44, pp. 4413-4425, 2001.
- (23) **Mahmood, G.I.**, Sabbagh, M.Z., and Ligrani, P.M., "Heat Transfer in a Channel With Dimples and Protrusions on Opposite Walls," AIAA Journal of Thermophysics and Heat Transfer, Vol. 15, No.3, July-September 2001.
- (24) **Mahmood, G.I.**, Hill, M.L., Nelson, D.L., Ligrani, P.M., Moon, H.-K., and Glezer, B., "Local heat transfer and flow structure on and above a dimpled surface in a channel," ASME Transactions- Journal of Turbomachinery, Vol. 123, January 2001.

4.2 Books and/or chapters in books

BOOK CHAPTER ON TURBOMACHINERY: Acharya, S. and **Mahmood, G.I.**, "Turbine Blade Aerodynamics," DOE Gas Turbine Handbook, NETL of the US Department of Energy, 2007, Ch. 4.3: p. 363-388,

4.3 Published full-length conference papers/poster presentations

- (1) Huyssen B.B., **Mahmood G.I.**, "Effects of Cylindrical-Hole Shape and Fillet on Flow and Temperature Fields in Vane Cascade with Endwall Film-Cooling," paper no. GT2020-14099, Proc. ASME Turbo Expo 2020, Sept. 21-25.
- (2) Shote S.A., **Mahmood G.I.**, and Meyer J.P., "Endwall Adiabatic Film-cooling Effectiveness with Upstream Film Cooling Schemes in a Filleted Vane Cascade," Proceedings, 14th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2019), pp. 510-523, July 22-24, 2019, Wicklow, Ireland.
- (3) Huyssen B., **Mahmood G.I.**, and Shote A., "Flow-fields for Upstream Film Cooling Configuration in a Vane Cascade," Proceedings, 14th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics

- (HEFAT 2019), pp. 730-736, July 22-24, 2019, Wicklow, Ireland.
- (4) **Mahmood G.I.** and Aasa S., "Internal groove influenced thermohydraulic performance on an air-channel," FEDSM2018-83236, Proceedings ASME 2018 5th Joint US-European Fluids Engr Summer Conf, July 15-20, 2018, Montreal, Canada. doi:10.1115/FEDSM2018-83236, ISBN: 978-0-7918-5155-5.
- (5) **Mahmood G.I.** and Arnachellan K., "Flow-Field in a Linear Vane Cascade with Endwall Fillet and Film-Cooling," FEDSM2018-83140, Proceedings ASME 2018 5th Joint US-European Fluids Engr Summer Conf, July 15-20, 2018, Montreal, Canada. doi:10.1115/FEDSM2018-83140, ISBN: 978-0-7918-5156-2.
- (6) Aasa S.A. and **Mahmood G.I.**, "EXPERIMENTAL PRESSURE PENALTY AND HEAT TRANSFER IN AN AIR CHANNEL WITH GROOVED WALL," International Conference on Sustainable Energy, 6th world sustainable energy forum, Vienna, Austria, 28 October 2016.
- (7) **Mahmood G.I.** and Acharya S., "Effects of Blade Leading Edge Fillet on Near Wall Pressure & Heat Transfer in a Linear Turbine Cascade," IMECE2014-39768, ASME2014 IMECE, Montreal, Canada, Nov., 2014.
- (8) **Mahmood G.I.** and Acharya S., "Blade and Vane Leading Edge Fillet on Endwall Cooling in Linear Turbine Cascades," IHTC15-9553, 15th Intl. Heat Transfer Conference, Kyoto, Japan, Aug., 2014.
- (9) Pretorius H.J., **Mahmood G.I.** and Meyer J.P., "Pressure Drop Along a Channel with Modified Short Pin-Fins," 10th Intl. Conf. on Heat Trans., Fluid Mech. and Thermodynamics, Florida, USA, July, 2014.
- (10) Roux S.M., **Mahmood G.I.** and Meyer J.P., "Modified Endwall Fluid Flow in a Dimpled Pin fin Array for Heat Transfer Enhancement," IHTC15-9230, 15th Intl. Heat Transfer Conference, Kyoto, Japan, Aug., 2014.
- (11) Roux S.M., **Mahmood G.I.**, and Meyer J.P., "Flow Field Around Dimpled Short Pin-Fins in a Staggered Array," 29th Congress of Intl. Council of Aeronautics Science, St. Petersburg, Russia, Sept. 2014.
- (12) Moghaddam D.G., **Mahmood G.I.**, Gaoming G., Bolster J., Besant R., and Simonson C.J., "Steady-state Performance of a Prototype (200 CFM) Liquid-to-Air Membrane Energy Exchanger (LAMEE) Under Summer and Winter Test Conditions," HT2013-17135, Proc. ASME 2013 Summer Heat Transfer Conf., Minnesota, USA, July 2013.
- (13) Nagar R.K., Meyer J.P., Alam Md.M., Spedding G.R., and **Mahmood G.I.**, "The Turbulent Wakes of Smooth and Dimpled Pin-fins," AIAA ISABE-2013-1221, Int. Symp. Air Breathing Engines, Busan, S. Korea, Sep. 2013.
- (14) Roux S.M., Meyer J.P., **Mahmood G.I.** and Mahbub A., "Heat Transfer in a Dimpled Short Pin-fin Array," Poster presentation, 8th World Cong. on Exp. Heat Tran. Fluid Mech. Thermody, Lisbon, Portugal, June, 2013.
- (15) **Mahmood G.I.** and Simonson C.J., "Frosting Conditions for an Energy Wheel in Laboratory Simulated Extreme Cold Weather," 7th Intl. Cold Climate HVAC Conf., Calgary, Canada, Nov., 2012.
- (16) Meyers, BC, Snedden, GC, Meyer, JP, Roos TH and **Mahmood G.I.** (2011), "Experimental results showing the internal three-component velocity field and outlet temperature contours for a model gas turbine combustor". International Symposium on Air Breathing Engines, Gothenburg, Sweden, September, 2011.
- (17) Meyers, BC, Snedden, GC, Meyer, JP, Roos TH and **Mahmood G.I.** (2009). Threedimensional particle image velocimetry in a generic can-type gas turbine combustor. 19th Conf. International Soc. Air Breathing Engines, Montreal, Canada, September, 2009.
- (18) **Mahmood, G.I.**, Gustafson, R., and Acharya, S., "Aerodynamics and Cooling Effectiveness on a Non-Axisymmetric Endwall," ASME Proc. Turbo Expo 2009, Orlando, Florida, GT2009-60236, June, 2009.
- (19) **Mahmood, G.I.**, Saha, A.K., and Acharya, S., "Endwall Flow Field and Film Cooling in a High Speed Linear Vane Cascade," 6th HEFAT International Conference 2008, Pretoria, South Africa.
- (20) **Mahmood, G.I.** and Smith, D.R., "Proportional Aerodynamic Control on a UAV Model Using Synthetic Jets," AIAA-2007-3851, Session:FD-2, 37th AIAA Fluid Dynamics Conference, Miami, Florida, 25-28 June 2007.
- (21) **Mahmood, G.I.**, and Acharya, S., "Measured Endwall Flow and Passage Heat Transfer in a Linear Blade Passage With Endwall and Leading Edge Modifications," ASME Proc. Turbo Expo 2007, Montreal, Canada, GT2007-28179, May 14-16, 2007.
- (22) Gustafson, R., **Mahmood, G.I.**, and Acharya, S., "Aerodynamic Measurements in a Linear Turbine Blade Passage with Three-Dimensional Endwall Contouring," ASME Proc. Turbo Expo 2007, Montreal, Canada, GT2007-28073, May 14-16, 2007.
- (23) Gustafson, R., **Mahmood, G.I.**, and Acharya, S., "Flow Field in a Film-Cooled Three-Dimensional Contoured Endwall Passage: Aerodynamic Measurements", ASME Proc. Turbo Expo 2007, Montreal, Canada, GT2007-28154, May 14-16, 2007.
- (24) Saha, A.K., **Mahmood, G.I.**, and Acharya, S., "The Role of Leading-Edge Contouring on End-wall Flow and Heat Transfer: Computations and Experiments," IGTI conf. proceedings, Spain 2006, GT2006-91318.
- (25) Acharya, S., Zhou, F., Lagrone, J., **Mahmood, G.I.**, and Bunker, R.S., "Latticework (Vortex) Cooling Effectiveness: Rotating Channel Experiments", International Gas Turbine and Aeroengine Technical Congress, Exposition, and Users Symposium, Austria, 2004.
- (26) Ligrani, P.M. and **Mahmood, G.I.**, "Spatially-Resolved Heat Transfer and Friction Factors in a Rectangular Channel with 45° Angled Rib Turbulators Channel", 47th Gas Turbine and Aeroengine Technical Congress, Exposition, and Users Symposium, Finland, May 2002.
- (27) **Mahmood, G.I.**, Hill, M.L., Nelson, D.L., Ligrani, P.M., Moon, H.-K., and Glezer, B., "Local heat transfer and flow structure on and above a Dimpled surface in a channel", 45th Gas Turbine and Aeroengine Technical

4.4 Technical reports

- G.I.Mahmood, A.K. Saha, R.Gustafson, and S. Acharya, "Endwall Cooling With Endwall Contouring and Leading Edge Fillet," semi-annual and annual reports submitted to the SCIES in South Carolina under the Advanced Gas Turbine Systems Research-High Efficiency Engines and Turbines (AGTSR-HEET) program, 2002, 2003, and 2004.
- G.I. Mahmood, "Endwall Cooling With Endwall Contouring And Leading Edge Fillet," Annual Technical Review Meeting, **CPERC (Clean Power & Energy Research Consortium)**, Univ. of New Orleans, August 2004.
- G.I. Mahmood, "Role of Blade Leading Edge Contouring and Passage-Endwall Contouring on Aerodynamic and Thermal Performances of Turbine Blade Passage," Univ. of Wyoming, November 2005.

5. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

5.1 Teamwork and collaboration with others:

CSIR and NRF of South Africa

5.2 Membership in national and international bodies

Associate Member of ASME, Associate Member of Institute of Engineers (Bangladesh).

Reviewer: ASME transaction J. Heat Transfer, J. Energy & Buildings, Int. J. Heat Mass Transfer, J. Thermal Engineering, J. thermal Sc Engineering.

6. AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

6.1 Evaluation status as scientist/scholar

NRF (South Africa) Rating C2, 2021-2026.

6.2 Research awards and prizes

- Best paper award from the ASME Turbo Expo 2006 by ASME Heat Transfer Committee, GT2006-91318, "The Role of Leading-Edge Contouring on End-Wall Flow and Heat Transfer: Computations and Experiments." (Saha, Mahmood, and Acharya)

7. RESEARCH FUNDS

NRF-Incentive funding for rated researcher, ZAR 30,000 (2021).

NRF-Incentive funding for rated researcher, ZAR 240,000 (2014-2020).

NRF-Competitive programme for rated researcher, ZAR 480,000 (2014-2016).

RDP-University of Pretoria, ZAR 40,000 (2013).

EIRT-University of Pretoria, ZAR 100,000 (2014).

ARMSCOR-CSIR, ZAR 260,000 (2014-2015).

ARMSCOR-CSIR, ZAR 130,000 (2016).