CURRICULUM VITAE

SHANKAR MAHALINGAM

Professor of Mechanical and Aerospace Engineering
Dean of the College of Engineering
The University of Alabama in Huntsville

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The University of Alabama in Huntsville, Huntsville, AL 35899
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EDUCATION

PhD	**Mechanical Engineering**	Stanford University	1989
MS	**Mechanical Engineering**	State University of New York at Stony Brook	1982
B. Tech	**Mechanical Engineering**	Indian Institute of Technology, Madras (*Graduated with Distinction*)	1980

ACADEMIC APPOINTMENTS

Professor   Department of Mechanical and Aerospace Engineering, *The University of Alabama in Huntsville, Huntsville* (2010 – present)

Professor   Department of Mechanical Engineering, *University of California, Riverside* (2000 - 2010)

Graduate Advisor   Department of Mechanical Engineering, *University of California, Riverside* (2000 – 2002)

Visiting Professor   Department of Mechanical Engineering, University of Coimbra, Coimbra, Portugal, while on sabbatical leave from the University of California, Riverside (in 2008)

Associate Professor   Department of Mechanical Engineering, *University of Colorado at Boulder*, and member of the Center for Combustion Research (1996 - 2000)

Invited Professor   Laboratoire *EM2C, Ecole Centrale Paris*, France while on sabbatical leave from the University of Colorado, Boulder (in 1997)

Affiliated Member   Department of Applied Mathematics, *University of Colorado at Boulder* (1995 - 2000)

Assistant Professor   Department of Mechanical Engineering, *University of Colorado at Boulder* and member of the Center for Combustion Research (1989 - 1996)

BRIEF BIOGRAPHY

Dr. Shankar Mahalingam is Dean of the College of Engineering and Professor in the Department of Mechanical and Aerospace Engineering at The University of Alabama in Huntsville (UAH). He received his B.Tech., graduating with distinction, from the Indian Institute of Technology, Madras, MS from the State University of New York at Stony Brook (now Stony Brook University), and PhD from Stanford University, all in Mechanical Engineering.

From 1989 to 2000, he was Assistant and then Associate Professor in the Department of Mechanical Engineering at the University of Colorado, Boulder. From 2000 to 2010, he was Professor in the Department of Mechanical Engineering at the University of California, Riverside, and served as Department Chair during six of these ten years. In 2010, he was recruited to his current role as Dean of the College of Engineering at UAH. He served as Visiting Professor in the Department of Mechanical Engineering at the University of Coimbra, Portugal, and Invited Professor at the Laboratoire EM2C, Ecole Centrale Paris, France. He worked as a Systems Engineer for Link Simulation Systems Division, Singer Company, Maryland from 1982-1984.

Professor Mahalingam's research interests include direct and large eddy simulations of turbulent combustion, forest fire modeling, flame spread experiments, computational fluid dynamics applied to turbulent combustion, acoustic-flow interactions pertinent to solid rocket motors, and cardiovascular fluid dynamics. He was amongst the earliest group of researchers to develop direct and large eddy simulation methodology to study coflowing jet diffusion flames. He is one of the leading experts in the area of modeling transition behavior in fires including marginal burning, and transition of surface fires to crown fires, utilizing both simulations and laboratory scale experimentation. He has received funding for his research as PI from a variety of agencies including AFOSR, NSF, ACS-PRF, USDAFS, and UCRLANL, and as co-PI on grants funded by AFOSR, ONR, SERDP, CAL-EPA-ARB, UCEI, JFSP, and industrial sources. He has authored or coauthored over 130 scientific papers that include 64 peer-reviewed papers (journals and refereed proceedings) and 73 full conference papers. His papers have appeared in leading journals including *International Journal of Wildland Fire*, *Combustion and Flame*, *Combustion Theory and Modeling*, *Combustion Science and Technology*, *Physics of Fluids*, *Proceedings of The Combustion Institute*, and the *AIAA Journal*. His current source of research funding is from the USDA (JFSP).

Dr. Mahalingam has taught undergraduate and graduate courses starting from introductory mechanical engineering classes to advanced, special topics classes for graduate students. He has taught over ten undergraduate courses (freshman to senior level) and over ten graduate courses. Dr. Mahalingam was the recipient of two departmental teaching awards and an outstanding advisor award while at the University of Colorado. He has successfully supervised/co-supervised the dissertations of 12 PhD students including 2 from UAH. He is currently co-supervising 2 PhD students at UAH and teaches one course every year.

He served as Associate Editor of the *AIAA Journal* and as a Member-at-Large of the Board of the Western States Section of The Combustion Institute.

Professor Mahalingam is a member of The Combustion Institute, American Physical Society (Fluid Dynamics), ASEE, AAAS, Tau Beta Pi, & Sigma Xi.

Dr. Mahalingam is an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA), Fellow of the American Society of Mechanical Engineers (ASME), and Fellow of the American Association for the Advancement of Science (AAAS).

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ADMINISTRATIVE APPOINTMENTS

Dean of the College of Engineering, *The University of Alabama in Huntsville, Huntsville*
(2010 – present)

Responsibilities include:
  Providing academic leadership in all its facets for a College composed of five academic departments, in the midst of a high technology community consisting of Fortune 500 corporations and governmental organizations including NASA's Marshall Space Flight Center and the Redstone Army Base. The College enrolls nearly 30% of UAH's undergraduates in ABET-accredited programs in aerospace, chemical, civil, computer, electrical, industrial and systems, mechanical, and optical engineering. In addition to MSE/MS degrees, PhD programs are offered in civil, computer, electrical, mechanical, industrial and systems engineering, materials science, optical science and engineering, and biotechnology science and engineering. The Dean, as chief academic and executive officer, reports to the Provost and Executive Vice President for Academic Affairs.
Summary Profile:
  The College of Engineering (COE) has 1981 undergraduate students, 520 graduate students, 56 FTE tenure line faculty, 5 lecturers, 2 clinical faculty, and 17 administrative and technical staff (Fall 2015 data). College annual budget excluding research contracts and grants is ~ $9.7 million. In 2014-2015, 336 Bachelors, 125 Masters, and 18 PhD's in engineering were awarded. Over the period 2010-2015, 1440 BS, 639 MS, and 84 PhD degrees in engineering were awarded by UAH,

  US News and World Report Graduate Engineering Program Ranking of COE has shown a steady rise with the most recent ranking of: 89 (2014), 88 (in 2013), 100 (2012), 107 (2011). In addition, for 2014, several graduate programs were ranked for the first time in the history of UAH.

Chair of the Department of Mechanical Engineering, *University of California, Riverside*
(2002-2006, & 2008 - 2010)

Responsibilities included:
  Planning the programs of the department in teaching, research, and other functions, including curriculum development, recruitment and evaluation of faculty and staff personnel, maintaining a climate hospitable to diversity and maintaining a department affirmative action program, budget preparation and administration of department financial affairs in accordance with University procedures.
Summary Profile:
  Department of Mechanical Engineering established in 2000, BS program is ABET accredited continuously since 1998, MS and PhD programs established in 2001. In 2010, the ME department had 15 faculty members, 4 office staff FTE's, 2 Technical staff FTE's, 449 undergraduate and 60 graduate students (figures as of October 2009). Annual research expenditure in 2008 was $1.8 million. New research grants with ME faculty members as PI's for fiscal year (July 1, 2009 – June 30, 2010) was over $2.5 million, 22 Masters and PhD degrees awarded in 2009, 2005 US News and World Report ranking of graduate program: 85 amongst 164 Mechanical Engineering programs surveyed.

OTHER PROFESSIONAL POSITIONS

Systems Engineer Link Simulation Systems Division, Singer Company, Silver Spring, MD (1982-1984)

AWARDS/RECOGNITIONS

Pi Tau Sigma award of "Outstanding 1991 ME Professor at CU" at the University of Colorado at Boulder (Spring 1991)

Pi Tau Sigma award of "Outstanding ME Professor at CU" at the University of Colorado at Boulder (Fall 1991)

University of Colorado Outstanding Undergraduate Advisor for 1991-92

Associate Editor, *AIAA Journal*, Term of appointment: 2002-2005

Associate Fellow AIAA (elected 2003)

Fellow ASME (elected 2010)

Tau Beta Pi (inducted 2014)

Fellow AAAS (elected 2015)

PROFESSIONAL & HONOR SOCIETIES

Member of Sigma Xi, Tau Beta Pi, American Physical Society, The Combustion Institute, International Association of Fire Safety Science (IAFSS), AAAS, AIAA, and ASME

DISSERTATIONS & THESES SUPERVISED AS PRINCIPAL ADVISOR

Student	PhD Dissertation Title	Year	University	Current Position
1. Akbar Ghafourian (supervised joint with John W. Daily)	Combustion Response to Acoustic Perturbation in Liquid Rocket Engines	1993	University of Colorado, Boulder	Associate Professor of Aerospace Engineering, Sharif University of Technology, Iran
2. Nedunchezhian Swaminathan	Structure of turbulent and laminar reaction zones	1994	University of Colorado, Boulder	Professor, Department of Engineering, Director of Studies & Fellow, Robinson College, University of Cambridge, UK
3. Kevin R. Anderson (supervised joint with Jean R. Hertzberg)	Effects of semi-confinement and heat release on the dynamics of unsteady reacting jets	1998	University of Colorado, Boulder	Professor of Mechanical Engineering, CalPoly University, Pomona, CA
4. Yottana Khunatorn (supervised joint with Robin Shandas)	A fluid dynamics study of the total cavopulmonary connection	2002	University of Colorado, Boulder	Assistant Professor, Department of Mechanical Engineering, Faculty of Engineering, Chiang Mai University,

				Thailand
5. Joshua Hsu	Incorporating Reduced Kinetic Mechanisms in Numerical Simulations of Nonpremixed Flames	2002	University of Colorado, Boulder	Senior Project Engineer at Meggitt PLC, North Hollywood, CA
6. Watit Pakdee	Analysis of Turbulent Nonpremixed Combustion of Wood Pyrolysis Gas via Numerical Simulations	2003	University of Colorado, Boulder	Assistant Professor, Department of Mechanical Engineering, Thammasat University, Thailand
7. Lulu Sun	Experimental and Theoretical Investigations of Fire Behavior in Live Fuels	2006	University of California, Riverside	Associate Professor, Freshmen Engineering Department, Embry-Riddle Aeronautical University, FL
8. Prasad Pokkuniri	A study of turbulent nonpremixed hydrogen combustion with different levels of modeling and computation	2007	University of California, Riverside	Assistant Professor, Department of Mechanical Engineering, Institute of Infrastructure, Technology, Research, And Management, India
9.Watchrapong Tachajapong	Understanding Crown Fire Initiation via Experimental and Computational Modeling	2008	University of California, Riverside	Assistant Professor, Department of Mechanical Engineering, Chiang Mai University, Thailand
10. Jesse Lozano	An investigation of surface and crown fire dynamics in shrub fuels	2011	University of California, Riverside	Currently at Meggitt USA, CA
11. Ambarish Dahale (supervised joint with Babak Shotorban)	Dynamics of shrub fires investigated via physics based modeling	2014	The University of Alabama in Huntsville	Currently at Convergent Science Inc., Madison, WI
12. B. L. Yashwanth (supervised joint with Babak Shotorban)	Computational investigation of the influence of heating modes and moisture content on pyrolysis and ignition of live fuels	2015	The University of Alabama in Huntsville	Currently at Simerics Inc., Huntsville, AL
13. Satyajeet Padhi (supervised joint with Babak Shotorban)	A computational investigation of shrub fire dynamics under the influence of wind	2016	The University of Alabama in Huntsville	Currently at UAH.

1) <u>M. S. Thesis</u>, Neal P. Sullivan, "*Numerical Experiments on Forced, Isotropic, Homogeneous Turbulence*," University of Colorado at Boulder, August 1992 (He later completed his PhD under

the supervision of Professor Melvyn Branch). Currently Associate Professor, Department of Mechanical Engineering, Colorado School of Mines, Golden, CO.

2) M. S. Thesis, Siming Mu, "*Direct Numerical Simulation of Acoustic-Mean Flow Interactions in Solid Rocket Motors*," University of Colorado at Boulder, December 1994.

3) M. S. Thesis, Jesse S. Lozano, "*Environmental Effects on the Fluid Dynamic Properties of a Propagating Flame*," University of California, Riverside, August 2008.

4) MS Thesis, Jing Li, "*Experimental Investigation of Bulk Density and its Role in Fire Behavior in Live Shrub Fuels*," University of California, Riverside, June 2011.

Currently co-supervising and funding PhD students (Selina Dover – unfunded, part-time, and Chandana Anand)

OTHER SENIOR PERSONNEL SUPERVISED

Xiangyang Zhou, Postdoctoral Researcher (2000-2004), Staff Research Associate (2004-2006), University of California, Riverside. Currently working as Senior Research Scientist at FM Global, Boston, MA.

UNDERGRADUATE STUDENTS SUPERVISED

Michael McCall (University of Colorado, Boulder, 1991) – Independent Study
Kevin Cash (University of Colorado, Boulder, 1991) – Independent Study
Christopher Connor (University of Colorado, Boulder, 1991-1993) – UROP Research Project
Michael Cotton (University of Colorado, Boulder, 1992) – Independent Study
Michael Read (University of Colorado, Boulder, 1995-1997) – Research
Michael Sheppy (UC Riverside) – Summer 2004
Luis Cardenas (UC Riverside) – MSIRP student from Stanford University - Summer 2004
Melvyn Taylor (UC Riverside) – Spring 2005 – Independent Study
Philip Ho (UC Riverside) – Fall 2005 – Independent Research
Nehemiah Aguierre (UC Riverside) – Spring 2008 – Independent Research
David Becerra – (UC Riverside) Fall 2008, Winter 2009 – Independent Research
Ramon Rodriguez – (UC Riverside) Fall 2009 – Independent Research

VISITING STUDENTS

Carlos Rossa, PhD student of Professor Viegas from the University of Coimbra, Portugal (2006)
Marc Sinou, undergraduate student, visiting from ENSICAEN, Caen, France (Summer 2009)

RECENT RESEARCH GRANTS & CONTRACTS

[b]*USDAFS* Forest Fire Laboratory, Riverside, CA, for research titled "Experimental and Numerical Modeling of Wildland Fire Spread Transitions," 07/06-07/09 $107,792 (*Principal investigator at UC Riverside*)

[a]*National Science Foundation* for research titled, "Collaborative Research: A Fundamental Investigation of Fire Initiation and Fire Behavior in Sparse Vegetation," 09/09-08/13, $297,333 (*Principal Investigator at UC Riverside*)

NOTE: (a) From the above NSF award, $290,222 was transferred from UCR to UAH in 2010, Dr. Babak Shotorban was added as co-PI

   (b) From the USDAFS Cooperative agreement, $48,000 was transferred to UAH via a subcontract from UCR.

USDAFS Forest Fire Laboratory, Riverside, CA, for research titled "Exploring the role of fuel moisture on pyrolysis gas flame structure and its influence on fire behavior," 09/10 – 08/11, $40,000 (*Principal Investigator*)

Gulf of Mexico Research Initiative Fund for research titled "High-fidelity Modeling of Transport of Oil-derived Particulates Using an Equilibrium Eulerian Method," 01/2011-o5/2012, $54,050 (*Co-Principal Investigator, PI: Shotorban*)

Joint Fire Sciences Program (JFSP) funded through the USDAFS for research titled "Simulation of the Effects of Convection and Radiation on Pyrolysis and Ignition of Moist Live Fuels," 09/11 – 09/15, $217,869 (*Co-Principal Investigator, PI: Shotorban*)

SERDP for research titled "Fundamental measurements and modeling of prescribed fire behavior in the naturally heterogeneous fuel beds of southern pine forests," 03/2016-01/2020, $2,112,347 (*Co-Principal Investigator at UAH for $394,287, PI: Shotorban*)

TEACHING (LIST OF COURSES TAUGHT)

The University of Alabama in Huntsville (Semester system), 2010 - present

Class size ranged from ~ 20-50 for sophomore and junior level classes, and ~10 for graduate class. MAE 310 is taught in a lecture capture facility. All classes are 3 semester hour courses. I teach one course per academic year.

Undergraduate Courses		Graduate Courses	
Statics	*(MAE/CE 271)*	Computational Fluid Dynamics I	*(MAE 623)*
Fluid Mechanics	*(MAE310)*		

University of California, Riverside (Quarter system), 2000-2010

Class size ranged from ~ 120 for Introduction to Mechanical Engineering, ~90 for sophomore, ~70 for junior classes, ~60 for senior classes, ~5-20 for graduate classes. I led the effort in developing the curriculum for several graduate courses leading up to approval of the graduate program (MS and PhD) in 2001. Most classes were 4 quarter hour classes including 3 lecture hours, and 1 discussion hour (the latter was typically handled by a TA in the case of undergraduate classes). I taught 4 courses per academic year, except during most of the years I served as department chair when I taught 2 courses per academic year.

Undergraduate Courses	Graduate Courses
Engineering Modeling and Analysis	Methods of Engineering Analysis
Combustion Engineering	Computational Methods in Engineering
Statics	Combustion and Environmental Applications
Fluid Mechanics	
Combustion and Energy Systems	
Transport Phenomena	
Introduction to Mechanical Engineering	
Introduction to Engineering Computation	

University of Colorado, Boulder (Semester system), 1989-2000

Class sizes were typically 60-80 for junior level classes, exceeding 100 in some cases. Graduate level classes ranged from a one-time high of 80 to typical numbers between 5 and 20. Some graduate classes taught via distance learning program (CATECS). Nearly all classes were 3 semester units. I taught four courses per academic year.

Undergraduate Courses	Graduate Courses
Fluid Mechanics	Viscous Flow
Heat Transfer	Spectral Computational Methods
Computational Methods	Combustion Science and Applications (team taught)
Mathematical Methods	Heat Transfer
	Turbulence
	Combustion Theory
	Computational Fluid Dynamics, Heat Transfer & Combustion
	Advanced Engineering Mathematics I
	Advanced Engineering Mathematics II

ENGINEERING EDUCATION RELATED MATERIAL ON THE WEB

"Ordinary Differential Equations (ODE) Survival Guide," by S. Mahalingam, 2001,
http://www.engr.ucr.edu/~shankar/oderev.pdf
"Essential Mathematics for Undergraduate Students in Mechanical Engineering," by S. Mahalingam,
April 2007, http://www.engr.ucr.edu/~shankar/ME-UGRAD-MATH.pdf

PEER-REVIEWED ARCHIVAL JOURNAL PUBLICATIONS

(*SM's current/former MS/PhD thesis students appearing as coauthors indicated with double asterisks*)

<u>1990</u>

(A01) Mahalingam S., B. J. Cantwell and J. H. Ferziger, "Full numerical simulation of coflowing, axisymmetric jet diffusion flames," <u>Physics of Fluids A</u>, **2** (5), pp. 720-728, 1990 (with SM's PhD Advisors).

(A02) Mahalingam S., J. H. Ferziger and B. J. Cantwell, "Self-Similar Diffusion Flame," <u>Combustion and Flame</u>, **82**, pp. 231-234, 1990 (with SM's PhD Advisors).

<u>1991</u>

(A03) Mahalingam S., B. J. Cantwell and J. H. Ferziger, "Stability of low speed reacting flows," <u>Physics of Fluids A</u>, **3** (6), pp. 1533-1543, 1991 (with SM's PhD Advisors).

<u>1992</u>

(A04) Mahalingam S., "Numerical solution of the viscous stability equations for low speed reacting flows," <u>International Journal for Numerical methods in Fluids</u>, **15** (6), pp. 729-741, 1992 (based on SM's PhD Thesis Research).

<u>1993</u>

(A05) Mahalingam S., "Self-Similar Diffusion Flame Including Effects of Streamwise Diffusion," <u>Combustion Science and Technology</u>, **89** (5-6), pp. 363-373, (1993).

<u>1994</u>

(A06) **Sullivan, N. P., S. Mahalingam, and R. W. Kerr, "Deterministic forcing of homogeneous, isotropic turbulence," <u>Physics of Fluids</u>, **6** (4), pp. 1612-1614, 1994.

<u>1995</u>

(A07) Mahalingam, S., J. H. Chen, and L. Vervisch, "Finite-rate chemistry and transient effects in direct numerical simulations of turbulent non-premixed flames," <u>Combustion and Flame</u>, **102** (3), pp. 285-297, 1995.

<u>1996</u>

(A08) ** Swaminathan, N., and S. Mahalingam, "Effects of shear and strain on the temporal evolution of laminar diffusion flames," <u>AIAA Journal</u>, **34** (1), pp. 89-95, 1996.

(A09) ** Mu, S., and S. Mahalingam, "Direct numerical simulation of acoustic-mean flow interactions in two-dimensional ducts," <u>AIAA Journal</u>, **34** (2), pp. 237-243, 1996.

(A10) ** Swaminathan, N., S. Mahalingam, and R. W. Kerr, "Structure of non-premixed reaction zones in numerical isotropic turbulence," <u>Theoretical and Computational Fluid Dynamics</u>, **8** (3) pp. 201-218, 1996.

(A11) **Anderson, K. A., J. R. Hertzberg, and S. Mahalingam, "Classification of absolute and convective instabilities in premixed bluff-body stabilized flames," <u>Combustion Science and Technology</u>, **112**, pp. 257-269, 1996.

(A12) **Swaminathan, N., and S. Mahalingam, "Assessment of conditional moment closure for single and multistep chemistry," <u>Combustion Science and Technology</u>, **112**, pp. 301-326, 1996.

(A13) Hwang, J., M. Sassi, S. Mahalingam, and J. W. Daily, "Laser-based characterization of a flame-assisted plasma," <u>Plasma Chemistry and Plasma Processing</u>, **16** (3), pp. 417-448, 1996.

<u>1997</u>

(A14) Weidman, P. D., and S. Mahalingam, "Axisymmetric stagnation point flow impinging on a transversely oscillating plate with suction," *Journal of Engineering Mathematics*, **31**, pp. 305-318, 1997.

1998

(A15) Mallik, S., D. Angirasa, and S. Mahalingam, "Limitations of boundary layer analyses for buoyant convection in stably stratified fluids," *Numerical Heat Transfer, Part A: Applications*, **34** (6), pp. 617-631, 1998.

1999

(A16) Mahalingam S., D. Thevenin, S. Candel, and D. Veynante, "Analysis and numerical simulation of a nonpremixed flame in a corner," *Combustion and Flame*, **118**, pp. 221-232, 1999.

(A17) **Anderson, K. R., S. Mahalingam, and J. Hertzberg, "A two-dimensional planar computational investigation of flame broadening in confined non-premixed jets," *Combustion and Flame*, **118**, pp. 233-247, 1999.

2000

(A18) **Anderson, K, R., and S. Mahalingam, "Numerical study of vortex/flame interaction in actively forced confined non-premixed jets," *Journal of Heat Transfer*, **122**, pp. 376-380, 2000.

2001

(A19) Shandas, R., M. Mitchell, C. Conrad, O. Knudson, J. Sorrell, S. Mahalingam, M. Fragoso, and L. M. Valdes-Cruz, "A general method for estimating deformation and forces imposed *in vivo* on bioprosthetic heart valves with flexible annuli: *in vitro* and animal validation studies," *Journal of Heart Valve Disease*, **10** (4), pp. 495-504, 2001.

(A20) Zhou, X., and S. Mahalingam, "Evaluation of reduced mechanism for modeling combustion of pyrolysis gas in wildland fire," *Combustion Science and Technology*, **171**, pp. 39-70, 2001.

2002

(A21) Mahalingam, S., and P. D. Weidman, "Activation energy asymptotic analysis and numerical modeling of a strained corner flame," *Combustion Theory and Modeling*, **6** (1), pp. 155-172, 2002.

(A22) **Khunatorn, Y., S. Mahalingam, R. Shandas, and C. DeGroff, "Influence of connection geometry and SVC-IVC flow rate ratio on flow structures within the total cavopulmonary connection: A numerical study," *ASME Journal of Biomechanical Engineering*, **124**(4), pp. 364-377, 2002.

(A23) Zhou, X., and S. Mahalingam, "A Flame Surface Density Based Model for Large Eddy Simulation of Turbulent Nonpremixed Combustion," *Physics of Fluids*, **14**(11), pp. L77-80, 2002.

2003

(A24) Zhou, X., and S. Mahalingam, "A suitable mixture fraction for diffusion flames of wood pyrolysis gas." *Combustion and Flame*, **133**, pp. 197-199, 2003.

(A25) Zhou, X., **L. Sun, D. Weise and S. Mahalingam, "Thermal particle image velocity estimation for fire plume flow," *Combustion Science and Technology*, **175** (7), pp. 1293-1316, 2003.

(A26) **Hsu, J., and S. Mahalingam. "Performance of reduced reaction mechanisms in unsteady nonpremixed flame simulations," *Combustion Theory and Modelling*, **7**, pp. 365-382, 2003.

(A27) **Khunatorn, Y., R. Shandas, C. DeGroff, and S. Mahalingam, "Comparison of *in vitro* velocity field measurements in a scaled total cavopulmonary connection with computational predictions," *Annals of Biomedical Engineering*, **31**(7), pp. 810-822, 2003.

(A28) **Pakdee, W., and S. Mahalingam, "An Accurate Method to Implement Boundary Conditions for Reacting Flows based on Characteristic Wave Analysis," *Combustion Theory and Modelling*, **7**(4), pp. 705-729, 2003.

2004

(A29) Coen, J., S. Mahalingam, and J. W. Daily, "Infrared imagery of crownfire dynamics during FROSTFIRE," *Journal of Applied Meteorology*, **43**(9), pp. 1241-1259, 2004.

(A30) Zhou, X., **Pakdee, W., and S. Mahalingam, "Assessment of a Flame Surface Density-Based Subgrid Turbulent Combustion Model for Nonpremixed Flames of Wood Pyrolysis Gas," *Physics of Fluids*, **16** (10), pp. 3795-3807, 2004.

2005

(A31) Zhou, X., Weise, D., and S. Mahalingam, "Experimental measurements and numerical modeling of marginal burning in live chaparral shrub fuel beds," *Proceedings of The Combustion Institute*, **30**, pp. 2287-2294, 2005.

(A32) Weise, D. R., X. Zhou, **L. Sun, and S. Mahalingam, "Fire spread in chaparral – "go or no-go?" *International Journal of Wildland Fire*, **14**, pp. 99-106, 2005.

(A33) X. Zhou, S. Mahalingam, and D. Weise, "Modeling of Marginal Burning State of Fire Spread in Live Chaparral Shrub Fuel Bed," *Combustion and Flame*, **143**, pp. 183-198, 2005.

2006

(A34) **L. Sun, X. Zhou, S. Mahalingam, and D. R. Weise, "Comparison of burning characteristics of live and dead fuels," *Combustion and Flame*, **144**, pp. 349-359, 2006.

2007

(A35) X. Zhou, S. Mahalingam, and D. Weise, "Experimental Study and Large Eddy Simulation of Effect of Terrain Slope on Marginal Burning in Shrub Fuel Beds," *Proceedings of The Combustion Institute*, **31**, pp. 2547-2555, 2007.

(A36) ** P. Prasad, and S. Mahalingam, "Exhaust gas recirculation effects on hydrogen air combustion," *Combustion Science and Technology*, **179**, pp. 1131-1157, 2007.

(A37) ** Pakdee, W., and S. Mahalingam, "Numerical investigation of turbulent combustion of wood pyrolysis gas – implication for turbulent model development," *Combustion, Explosion, and Shock Waves*, **43** (3), pp. 258-275, 2007.

2008

(A38) **W. Tachajapong, **J. Lozano, S. Mahalingam, X. Zhou, and D. R. Weise, "An Investigation of Crown Fuel Bulk Density Effects on the Dynamics of Crown Fire Initiation," *Combustion Science and Technology*, **180** (4): 593-615, 2008.

2009

(A39) **W. Tachajapong, **J. Lozano, S. Mahalingam, X. Zhou, and D. R. Weise, **"**Experimental and Numerical Modeling of Shrub Crown Fire Initiation," *Combustion Science and Technology*, **181**: 618-640, 2009.

2010

(A40) **J. Lozano, **W. Tachajapong, D. R. Weise, S. Mahalingam, and M. Princevac, "Fluid Dynamics Structures in a Fire Environment Observed in Laboratory Scale Experiments," *Combustion Science and Technology*, **182**: 858-878, 2010.

(A41) S. Hosseini, Q. Li, D. Cocker, D. R. Weise, A. Miller, M. Sharivastava, M. Lemmetty, W. Miller, S. Mahalingam, M. Princevac, W. M. Hao, R. Yokelson, M. T. Odman, .T.J. Johnson, J. Reardon, and H. Jung, "Particle Size Distribution, Morphology and Density From Laboratory-Scale Biomass Fires Using Fast Response Instruments and TEM Analysis," *Atmospheric Chemistry and Physics*, **10**: 8065-8076, 2010.

2013

(A42) **A. Dahale, **S. Ferguson, B. Shotorban, and S. Mahalingam, "Effects of Distribution of Bulk Density and Moisture Content on Shrub Fires," *International J. Wildland Fire*, **22** (5), pp. 625-641, 2013.

(A43) **S. Ferguson, **A. R. Dahale, B. Shotorban, S. Mahalingam, and D. R. Weise, "The role of moisture on combustion of pyrolysis gases in wildland fires," *Combustion Science and Technology*, **185**: 435-453, 2013.

2014

(A44) Samimi Abianeh, O., C. P. Chen, and S. Mahalingam, "Numerical modeling of multi-component diesel fuel spray evaporation process," *International Journal of Heat and Mass Transfer*, 69: 44-53, 2014.

(A45) **W.Tachajapong, **J.Lozano, S. Mahalingam, and D. R. Weise, "Experimental modeling of crown fire initiation in open and closed shrubland systems," *International J. Wildland Fire*, 4, pp. 451-462, 2014.

(A46) H. Pan, S. Pournazeri, M. Princevac, J. W. Miller, S. Mahalingam, M. Y. Khan, V. Jayaram, and W. A. Welch, "Effect of Hydrogen Addition on Criteria and Greenhouse Gas Emissions for a Marine Diesel Engine," *International Journal of Hydrogen Energy*, **39** (21), pp.11336-11345, 2014.

(A47) Samimi Abianeh, O., C. P. Chen, and S. Mahalingam, "Modelling of Multi-Component Droplet Coalescence in Evaporating and Non-Evaporating Diesel Fuel Sprays," *International Journal of Automotive Technology*, pp. 1091-1100, **15** (7), 2014.

2015

(A48) **Yashwanth, B. L., B. Shotorban, S. Mahalingam, and D. R. Weise, "An investigation of the influence of heating modes on ignition and pyrolysis of woody wildland fuel," *Combustion Science and Technology*, **187**, pp. 780-796, 2015.

(A49) **Dahale, A., B. Shotorban, and S. Mahalingam, "Interactions of fires of neighboring shrubs in two- and three-shrub arrangements," *International J. Wildland Fire*, **24** (5), pp. 624-639, 2015.

2016

(A50) Yashwanth, B. L., B. Shotorban, S. Mahalingam, C. Lautenberger, and D. R. Weise, "A numerical investigation of the effect of radiation and moisture on the pyrolysis and ignition of a leaf-like fuel element" *Combustion and Flame*, **163**, pp. 301-316, 2016.

(A51) **Padhi, S., B. Shotorban, and S. Mahalingam, "Computational investigation of flame characteristics of a non-propagating shrub fire," submitted, 2015.

(A52) Weise, D. R., E. Koo, X. Zhou, S. Mahalingam, F. Morandini, and J.-H. Balbi, "Fire spread in chapparal – model comparison in high bulk density fuels," submitted 2015

RECENT REFEREED CONFERENCE PROCEEDINGS

(RC13) **Dover, S., **A. Dahale, B. Shotorban, S. Mahalingam, and D. R. Weise, "Influence of Vegetation Moisture on Combustion of Pyrolysis gases in Wildland Fires," *Proceedings of the ASME 2011 IMECE*, November 11-17, Denver, 2011.

(RC14) **Dahale, A., **S. Dover, B. Shotorban, and S. Mahalingam, **"**Effects of Crown bulk Density Distribution and Thermophoresis Forces on Soot Particles in Wildland Fires," *Proceedings of the ASME 2011 IMECE*, November 11-17, Denver, 2011.

PEER REVIEWED CONFERENCE ABSTRACTS

(RA01) Shandas R., **Y. Khunatorn, C. DeGroff, W. Orlando, S. Mahalingam, L. M. Valdes-Cruz, "An assessment of the major flow features that affect energy loss and potential for thrombus formation within the modified total cavo-pulmonary connection: computational and *in vitro* studies," *Journal of the American College of Cardiology*, 39:401A, 2002.

RECENT CONFERENCE PROCEEDINGS (FULL PAPERS, NON-REFEREED)

(C56) J. Lozano, S. Mahalingam, and D. R. Weise, "A detailed examination of laboratory scale crown fire initiation in spatially segregated shrubs," paper presented at the *VI International Conference on Fire Research*, Coimbra, Portugal, 15-18 November 2010.

(C57) C. Bartolome, M. Princevac, A. Venkatram, S. Mahalingam, D. R. Weise, G. Achtemeier, H. Vu, and G. Aguilar**, "**Laboratory Measurements and Sensitivity Modeling of Droplet Characteristics and Implications for Superfog," paper ILASS2011-146, 23rd Annual Conference of ILASS-Americas, Ventura, CA, May 15-18, 2011.

(C58) Bartolome, C., M. Princevac, A. Venkatram, S. Mahalingam, G. Achtemeier, D. R. Weise, H. Vu, and G. Aguilar, "Numerical and physical investigation of the properties of superfog," 92nd Annual American Meteorological Society Meeting, New Orleans, LA, January 22-26, 2012.

(C59) Lu, V., K. Tsui, C. Bartolome, M. Princevac, A. Venkatram, S. Mahalingam, G. Achtemeier, and D. R. Weise, "Laboratory measrrements and characterization of smoldering smoke from pine needle fuel beds," ," 92nd Annual American Meteorological Society Meeting, New Orleans, LA, January 22-26, 2012.

(C60) Weise, D. R., W. E. Mell, X. Zhou, and S. Mahalingam, "Use of the Wildland-urban interface Fire Dynamics Simulator to Model Fire Spread in Chamise Chaparral Fuel Beds," Paper 12S-06, presented at the Spring WSS/CI Meeting of The Combustion Institute, Tempe, AZ, March 19-20, 2012.

(C61) Padhi, S., A. R. Dahale, B. Shotorban, and S. Mahalingam, "Effects of crown separation distance and wind on crown fuel ignition in sparse vegetation," Paper presented at the CSS/CI Meeting of The Combustion Institute, Dayton, OH, April 22-24, 2012.

(C62) Abianeh, O. S., C. P. Chen, and S. Mahalingam, "Modeling of multicomponent droplets collision in dense evaporating and cold sprays," Paper to be presented at the 25th Annual Conference on Liquid Atomization and Spray Systems, Pittsburgh, PA, May 5-8, 2013.

(C63) Padhi, S., A. R. Dahale, B. Shotorban, and S. Mahalingam, "Numerical investigation of stationary shrub fire in crosswind," Paper 070FR-0073 to be presented at the 8th U.S. National Combustion Meeting, Salt Lake City, UT, May 19-22, 2013.

(C64) Dahale, A., S. Padhi, B. Shotorban, and S. Mahalingam, "Flame merging in two neighboring shrub fires," Paper 070FR-0198 presented at the 8th U.S. National Combustion Meeting, Salt Lake City, UT, May 19-22, 2013.

(C65) Yashwanth, B.L., S. Ferguson, B. Shotorban, S. Mahalingam, and D. R. Weise, "Numerical investigation of influence of moisture content on thermal behavior of heated wood," Paper 070FR-0208, presented at the 8th U.S. National Combustion Meeting, Salt Lake City, UT, May 19-22, 2013.

(C66) Abianeh, O. S., C. P. Chen, and S. Mahalingam, "Multicomponent fuel evaporating spray in high pressure hot gas flow," AIChE Annual Meeting, November 3-8, 2013.

(C67) Yashwanth, B. L., B. Shotorban, S. Mahalingam, and D. R. Weise, "A numerical investigation of the effect of moisture content on pyrolysis and combustion of live fuels," Paper D402, Central States Section of The Combustion Institute, Spring Technical Meeting, Tulsa, OK, March 17-18, 2014.

(C68) Anand, C., B. Shotorban, and S. Mahalingam, "Development of a module for modeling dynamical and thermal behavior of firebrands in WFDS," Paper 2D05, 9th US National Combustion Meeting, Cincinnati, OH, May 17-20, 2015.

(C69) Padhi, S., B. Shotorban, and S. Mahalingam, "A computational investigation of the interactions of shrub fires under the influence of wind," Paper 2D06, 9th US National Combustion Meeting, Cincinnati, OH, May 17-20, 2015.

(C70) Yashwanth, B. L., B. Shotorban, and S. Mahalingam, "Understanding the role of moisture in live fuels subject to pyrolysis and ignition through radiation heat transfer," Paper 1D05, 9th US National Combustion Meeting, Cincinnati, OH, May 17-20, 2015.

(C71) Yashwanth, B. L., B. Shotorban, and S. Mahalingam, "A computational investigation of the role of moisture in live fuels subject to pyrolysis and ignition through convective heat transfer," Paper 1D18, 9th US National Combustion Meeting, Cincinnati, OH, May 17-20, 2015.

(C72) Yashwanth, B. L., J. R. Gallacher, B. Shotorban, S. Mahalingam, T. H. Fletcher, and D. R. Weise, "Experimental and numerical investigation of the effect of heating modes and moisture content on ignition and pyrolysis of live fuels," Paper 1D06, 9th US National Combustion Meeting, Cincinnati, OH, May 17-20, 2015.

(C73) Weise, D. R., E. Koo, Z. Zhou, S. Mahalingam, and F. Morandini, "Comparison of Wildland Fire Rate of Spread Models in Chaparral Fuel Beds," Paper 2D16, 9th US National Combustion Meeting, Cincinnati, OH, May 17-20, 2015.

SHORT COURSE

Mahalingam, S. "The Role of Combustion and Heat Transfer in Fire Spread," Short Course on Fire Behavior, *6th International Conference on Forest Fire Research*, Coimbra, Portugal, November 13, 2010.

RECENT ABSTRACTS

52) Li, J., S. Mahalingam and D.R. Weise, 'Experimental Investigation of Bulk Density and its Role in Fire Behavior in Live Shrub Fuels' Poster Paper Presentation, *10th International Symposium on Fire Safety Science*, June 19-24, 2011.

53) Bartolome, C., M. Princevac, A. Venkatram, S. Mahalingam, D. R. Weise, G. Achtemeier, H. Vu, G. Aguilar, V. Lu, and K. Tsui, "Laboratory and Numerical Modeling of Smoke Characteristics for Superfog Formation," American Geophysical Union, San Francisco, CA, Dec 5-9, 2011.

54 Bartolome, C., M. Princevac, A. Venkatram, S. Mahalingam, G. Achtemeier, D. R. Weise, and G. Aguilar, "Numerical and physical investigation of the properties of superfog," 92nd American Meteorological Society Annual Meeting, New Orleans, LA, January 22-26, 2012.

55) Lu, V, K. Tsai, C. Bartolome, M. Princevac, A. Venkatram, S. Mahalingam, G. Achtemier, and D. R. Weise, "Laboratory measurements and characterization of smoldering smoke from pine needle fuel beds," 92nd American Meteorological Society Annual Meeting, New Orleans, LA, January 22-26, 2012.

56) Dahale, A., B. Shotorban, and S. Mahalingam, "Physics-based modeling of shrub fires: study of distribution of bulk density and moisture content," abstract L26.3, 2012 APS (DFD) Meeting, November 18-20, 2012.

57) Weise, D. R., W. E. Mell, X. Zhou, and S. Mahalingam, "Simulating fire spread in chamise chaparral fuel beds," 5th International Fire Ecology and Management Congress, Oregon, PO, December 3-7, 2012.

58) Weise, D. R., W. E. Mell, X. Zhou, and S. Mahalingam, "Simulating fire spread in chamise chaparral fuel beds," 4th Fire Behavior and Fuels Conference, Raleigh, NC, February 18-22, 2013.

59) Yashwanth, B. L., B. Shotorban, and S. Mahalingam, "A full-physics computational study of pyrolysis and ignition of a leaf-like fuel element exposed to convective heating," 6th International Fire Ecology and Management Congress, San Antonio, TX, November 16-20, 2015.

PROFESSIONAL ACTIVITIES

Board Member of the Western States Section of the Combustion Institute, representing CU Boulder, 1992-1998, representing UCR, 2003-2008, UCR alternate member, 2008-2010

Reviewer of proposals for NSF, NASA, ARO, American Chemical Society

Referee for several scientific journals including

Combustion and Flame,Combustion Science and Technology, Canadian Journal of Forest Research, ASME Journal of Heat Transfer, International Journal of Heat and Mass Transfer, Journal of Computational Physics, Journal of Computational and Applied Mathematics, Journal of Fluid Mechanics, AIAA Journal, Physics of Fluids, Physical Review Letters, Combustion Theory and Modelling, Proceedings of the Combustion Institute, International Association of Fire Safety Science Symposium, Measurement Science and Technology, International Journal of Wildland Fire

Program Review Subcommittee for the *International Combustion Symposium*, 1990, 1992, 1994, 1996, 1998, 2000

Program Review Subcommittee for the *Eighth International Symposium on Transport Phenomena in Combustion*, San Francisco, July, 1995

Member of the Host Committee, *15th International Colloquium on the Dynamics of Explosions and Reactive Systems*, University of Colorado at Boulder, July-August, 1995

Member of the Organizing Committee, *27th International Combustion Symposium*, University of Colorado at Boulder, July 1998