

Curriculum Vitae



1- Personal Information:

Mohammad Zabetian Targhi
Birth date: 5/23/1982, Nationality: Iranian
Assistant Professor of Mechanical Engineering, Tarbiat Modares University
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2- Educational Record:

- BSc in Mechanical Engineering, Iran University of Science and Technology, 2000-2005.
GPA: 16.97/20.0, Thesis Grade: 20.0/20.0, Thesis Title: Thermal analysis of internal combustion engine
- MSc in Mechanical Engineering, Sharif University of Technology, 2005-2007.
GPA: 17.77/20.0, Thesis Grade: 20.0/20.0, Thesis Title: Analysis and computational modeling of homogeneous charge compression ignition engines
- PhD in Mechanical Engineering, Sharif University of Technology, 2007-2013.
GPA: 18.39/20.0, Thesis Grade: Excellent, Thesis Title: Theoretical and experimental investigation of integration of laser beam with particulate microflows

3- Awards:

- Rank 35 among 330,000 participants in Islamic Azad University BSc entrance exam, 2000.
- Rank 26 among 8,500 participants in National MSc entrance exam of Mechanical engineering, 2005.
- Rank 30 among 7,000 participants in National MSc entrance exam of Aerospace engineering, 2005.
- Rank 1st among 1100 participants in PhD entrance exam of Mechanical engineering at Sharif University of Technology, 2007.
- Rank 2nd among 800 participants in PhD entrance exam of Mechanical engineering at Amirkabir University of Technology, 2007.
- First and Third Ranks in 4th National Fluid Mechanics Competition, Isfahan University of Technology, 2019
- First rank of third innovation and invention festival of Iranian combustion institute (ICI) for plan entitled: Experimental set up of premixed burner, 2019
- Second rank of Bio-idea market at biotechnology conference of Tarbiat Modares university, 2018, Dec, 16.
- Scholarship from Sharif University of Technology for outstanding achievement in educational record: 2007-2008.
- Honored Student During BSc (7 Semesters), MSc (3 Semesters) and PhD (8 Semesters).
- Research assistant during PhD program: 2007-2011.
- PhD thesis was granted by industrial Development and Renovation organization of Iran (IDRO), 2009-2011.
- Best PhD thesis of Iran, awarded by Iranian Society of Mechanical Engineers (ISME), 2013.
- Best Reviewer at 27th ISME conference, 2019.

4- Publications:

• Journal publications:

- 1- M.Zabetian, A.Mozaffari, Combustion simulation of natural gas in homogeneous charge compression ignition(HCCI) engines and analysis of effect of engine operating conditions on combustion initiation, Volume 5 , Issue 15, 2009 January 1, {Pages 1-10 }.
- 2- M.Zabetian, M.S.Saidi, M.B.Shafii, M.H.Saidi, Separation of microparticles suspended in a minichannel using laser radiation pressure, Applied Optics Vol. 52, Iss. 20, pp. 4950–4958 (2013)
- 3- M.Zabetian, M.H.Saidi, M.S.Saidi, M.B.Shafii, Modeling of Laser Thermal and Hydrodynamic Effects on a Dilute Suspension of Micro-Particles in Water, Journal of Mechanical Science and Technology, Vol.28, No.2, pp.1017-1026, 2013.
- 4- M.Zabetian, M.B.Shafii, M.H.Saidi, M.S.Saidi, A New Experimental Approach to Investigate the Induced Force and Velocity Fields on a Particulate Manipulation Mechanism, Scientia Iranica, Vol 21, No.2, pp.414-424, 2014.

- 5- Gholamhossein Taherian, Mahdi Nili-Ahmadabadi, Mohammad Zabetian, M Karbasipour, Two-dimensional investigation of free convection flow around a heated horizontal cylinder immersed in water using PIV technique, *Journal of Solid and Fluid Mechanics* , Volume 4 , 2014 January , {Pages 107-117 }.
- 6- H.Keramati, M.H.Saidi, M.Zabetian, Stabilization of Suspension of Zirconia Microparticles Using Nanoparticle Halos Mechanism: Zeta Potential, *Journal of Dispersion Science and Technology*, Vol 37, No.1, pp 6-13, 2015.
- 7- Hadi Keramati, Mohammad Hassan Saidi, Mohammad Zabetian, Experimental analysis on stabilization of zirconia microparticles suspension using nanoparticle halo mechanism, *Modares Mechanical Engineering*, Volume 15 , Issue 5, 2015 July 1, {Pages }
- 8- Reza Razaghi, Farhud Shirinzadeh, Mohammad Zabetian, Erfan Aghanoorian, Velocity Domain and Volume Fraction Distribution of Heavy Micro-Particles in Low-Reynolds Number Flow in Microchannel, *Journal of Dispersion Science and Technology*, Vol 38, No.3, pp 374-380, 2017.
- 9- Mostafa Nabipour¹, Seyed Ali Akbar Salehi Neyshabouri¹, Reza Sadeghi Dodaran¹, Amir Reza Zarrati, Seyed Hossein Mohajeri, Mohammad Zabetian, Experimental study of side looking ADV probe accuracy in a turbulent flow field, Vol. 18, No. 01, pp. 406-412, 2018.
- 10- A Mohammadebrahim Y Oghabneshin, S Sedighi, M Zabetian, Investigation on the effect of pressure on in-cylinder swirl flow by the flow rig which is an equipped swirl meter with experimental and numerical simulation methods, *Modares Mechanical Engineering*, Volume 17 , Issue 3, 2017 March 15, {Pages 327-335 }.
- 11- Mostafa Nabipour, Seyed Ali Akbar Salehi Neyshabouri, Seyed Hossein Mohajeri, Amir Reza Zarrati, Mohammad Zabetian, Study on turbulent flow in a compound channel with shallow overbank using Particle Image Velocimetry *Modares Mechanical Engineering*, Volume 17 , Issue 8, 2017 August 9, {Pages 164-172 }.
- 12- Hossein Soltanian, Mohammad Zabetian, Hadi Pasdarsahri, Important combustion species detection by flame natural emission spectroscopy in perforated burner, *Modares Mechanical Engineering*, Volume 18 , Issue 4, 2018 January , {Pages 601-606 }
- 13- Shahrzad Ebadati, Mohammad Zabetian, Analytical modeling of a mechanism for micro-particle measurement and separation using thermophoresis and photophoresis, *Modares Mechanical Engineering*, Volume 18 , Issue 1, 2018 March , {Pages 94-102 }
- 14- Shahrzad Ebadati, Danial Zarbaf, Mohammad Zabetian, Yaser Oghabneshin, Experimental Study of the Laser Induced Flow and Thermophoresis of Suspending Microparticles, *Transp Phenom Nano Micro Scales*, Volume 6, Issue 2, pp 15-19, 2018. DOI: 10.22111/tpnms.2018.23940.1146
- 15- Yaser Oghabneshin, Sadegh Seddighi, Mohammad Zabetian, Abolfazl MohammadEbrahim, Experimental and Numerical Analysis of the In-Cylinder Swirl Flow Dependence on the Pressure, Heat and Mass Transfer DOI 10.1007/s00231-018-2384-5 , 2018.
- 16- Omid Zahedi, Mehdi Sojoodi, Mohammad Zabetian, Mansoureh, Blood particles separation using dielectrophoresis in a novel microchannel: Numerical study, Accepted for publication in *CELL Journal*, 2019.
- 17- Hossein Soltanian, Mohammad Zabetian Targhi, Hadi Pasdarsahri, Chemiluminescence usage in finding optimum operating range of multi-hole burners, Accepted for publication in *Energy*, 2019.
- 18- Mahdi Najarnikoo, Mohammad Zabetian Targhi, Hadi Pasdarsahri, Experimental study on the flame stability and color characterization of cylindrical premixed perforated burner of condensing boiler by image processing method, *Energy*, 2019, <https://doi.org/10.1016/j.energy.2019.116130>
- 19- Yousef Alihosseini, Mohammad Zabetian Targhi, Mohammad Mahdi Heyhat, Nima Ghorbani, Effect of a micro heat sink geometric design on thermal-hydraulic performance: a Review, *Applied Thermal Engineering*, Vol.170, 2020, DOI: <https://doi.org/10.1016/j.applthermaleng.2020.114974>.
- 20- Omid Zahedi, Mohammad Zabetian, Mehdi Sojoodi, Mansoureh Movahedin, Dielectrophoretic separation of monocytes from cancer cells in a microfluidic chip using electrodes pitch optimization, Accepted for publication in *Bioprocess and Biosystems Engineering Journal*, 2020.
- 21- Sasan Azarmanesh, Mohammad Zabetian, Comparison of laser ignition and spark plug by thermodynamic simulation of multi-zone combustion for lean methane-air mixtures in the internal combustion engine, *Energy*, 2020. DOI: <https://doi.org/10.1016/j.energy.2020.119309>
- 22- Yousef Alihosseini, Mohammad Zabetian Targhi, Mohammad Mahdi Heyhat, Thermo-hydraulic performance of wavy microchannel heat sink with oblique grooved finned, *Applied Thermal Engineering*, 2021

- **Main Conference Proceedings:**

1. H.Keramati, M.Zabetian, M.H.Saidi, A.A.Mozafari, Experimental Characterization of Stabilized Suspensions Caused by Formation of Nanoparticle Halos, ASME, ICNMM 2014, August 3-7, Chicago, Illinois, USA.

2. M.Zabetian, M.S.Saidi, M.H.Saidi, M.B.Shafii, Thermal interaction of laser beam with particulate flows, 9th International Conference on Nanochannels, Microchannels and Minichannels, ASME, ICNMM 2011, June 19-22, 2011, Edmonton, Canada
3. M.Zabetian, M.H.Saidi, M.B.Shafii, M.S.Saidi, Laser induced flow in particulate media, 7th International Conference on Computational Heat and Mass Transfer, July 18-22, 2011, Istanbul, Turkey
4. R.Rohani, M.Zabetian, M.H.Saidi, M.S.Saidi, M.B.Shafii, An experimental study on the stability and homogeneity of a dilute dispersion of micro-particles, 8th International Conference on Multiphase Flow, ICMF 2013, Jeju, Korea, May 26 - 31, 2013.
5. A.Ghasemi, M.Zabetian, B.Sajjadi, R.Niroomand, M.H.Saidi, A New Method for Optimizing the Air Circulation System in the Car Paint Booths, 21th Annual International Conference on Mechanical Engineering-ISME2013, 7-9 May, 2013, School of Mechanical Eng., K.N.Toosi University, Tehran, Iran.
6. S.N.Saeidi, S.E.Kiaei, B.Sajadi, M.Zabetian, M.H.Saidi, Experimental investigation of indoor airflow using PIV technique, Clima 2010 - REHVA World Congress, Antalya Turkey, May 9-12, 2010
7. M.Zabetian, A.Mozafari, Combustion of natural gas in homogenous charge combustion compression ignition engines, analysis, oxidation mechanisms and controlling strategies, Conference on Applications and Design in Mechanical Engineering, 25-26 October 2007, Kangar, Perlis, Malaysia
8. M.H.Shojaefard, A.R.Noorpoor, M.Zabetian, M.Ghaffarpour, Analysis of engine operating conditions on thermal behavior of piston, International conference on recent advances in mechanical and material engineering(ICRAMME2005), Malaysia, 2005.
9. M.Zabetian, M.Rashidi, R.Maddahian, Design of an optical imaging and spectroscopy system for combustion measurement in internal combustion engines, Seminar on sensor science and technology, Sharif university of technology, November 2015, Tehran, Iran.
10. R. Niroomand, M. Zabetian, B. Sajadi, A. Ghasemi, M.H. Saidi, On the Energy Recovery in the Paint Booths, The Seventh International Conference on Heating, Ventilating and Air Conditioning, May 2016, Tehran, Iran
11. S.Ebadati, M.Zabetian, Analytical Modeling of Laser Induced Thermophoretic Velocity and Thermal Diffusivity for Microparticles Suspended in Liquids, 25th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2017, School of Mechanical Eng., Tarbiat Modares University, Tehran, Iran.
12. O.Zahedi, M.Sojoodi, M.Zabetian, M.Movahedin, A short review on blood cells separation and sorting methods, 25th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2017, School of Mechanical Eng., Tarbiat Modares University, Tehran, Iran.
13. A.Ghasemipناه, M.Zabetian, L.Montazeri, Experimental investigation of sperm separation for invitro fertilization applications, using inherent instincts of the fluid and sperm motility, 19th Congress on Reproductive Biomedicine & 14th Congress on Stem Cell Biology and Technology, August, 2018, Tehran, Iran. (The paper was awarded as the best poster of the congress).
14. M.Zabetian, Y.Oghabneshin, E.Partovi, M.Nahvi, N.Ghorbani, Training of Infrared, Laser Induced Florescence, Mechanical and Electrical thermometry methods by the interactive devices, 27th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2019, Tehran, Iran (to be presented).
15. S.L.Tabatabaei, M.Zabetian, Design and Numerical study of a microchip for separation of Biological, 27th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2019, Tehran, Iran(to be presented).
16. Y.Ali Hosseini, M.Zabetian, M.M.Heyhat, A.Rezazad Bari, Numerical simulation of fluid flow and heat transfer in oblique channels with rectangular cross-sections, , 27th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2019, Tehran, Iran(to be presented).
17. M.Zabetian, Y.Oghabneshin, E.Partovi, M.Nahvi, N.Ghorbani, Training of Infrared, Laser Induced Florescence, Mechanical and Electrical thermometry methods by the interactive devices, 27th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2019, Tehran, Iran.
18. S.L.Tabatabaei, M.Zabetian, Design and Numerical study of a microchip for separation of Biological, 27th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2019, Tehran, Iran.
19. Y.Ali Hosseini, M.Zabetian, M.M.Heyhat, A.Rezazad Bari, Numerical simulation of fluid flow and heat transfer in oblique channels with rectangular cross-sections, , 27th Annual International Conference on Mechanical Engineering-ISME2017, 2-4 May, 2019, Tehran, Iran.
20. M.Zabetian, Y. Oghabneshin, M. Nahvi, E. Partovi, The Training Methods of Measuring the Velocity and Flow of Gases Using Interactive Systems, 18th Fluid Dynamics Conference (FDC2019), 5-7 September 2019, Ferdowsi University of Mashhad, Mashhad, Iran.
21. Ziaulhaq Ahmadi, Mohammad Zabetian, Chemiluminescence for estimating heat release of perforated burners used in condensing boilers, The 8th Fuel and Combustion Conference of Iran, Tabriz, Iran, 2020.

22. Nima Ghorbani, Mohammad Zabetian Targhi, Mohammad Mahdi Heyhat, Numerical Study of Thermal-Hydraulic Performance of Wavy Microchannels for Electronic Cooling Application, The 28th Annual International Conference of Iranian Society of Mechanical Engineering, Tehran, Iran, May 2020.
23. Marzie Yaghubi, Mohammad Zabetian Targhi, Seyed Ali Tabatabaei, A Numerical Study of Effect of Cross-Section in Spiral Microchannel to Cell Separation, The 28th Annual International Conference of Iranian Society of Mechanical Engineering, Tehran, Iran, May 2020.
24. Ghassem Heidarinejad, Mohammad Zabetian Targhi, Seyed Ali Fatemi, Optimization the parameters of a heat pump connected to solar collectors for efficient heating, The 28th Annual International Conference of Iranian Society of Mechanical Engineering, Tehran, Iran, May 2020.
25. Nima Ghorbani, Mohammad Zabetian Targhi, Mohammad Mahdi Heyhat, Experimental Study of Thermal-Hydraulic Performance of a Novel Microchannel Heat Sink for Electronic Cooling Application, The 28th Annual International Conference of Iranian Society of Mechanical Engineering, Tehran, Iran, May 2020.
26. Numerical study on the beating tail of a micro-organism and the effects of geometric and wave parameters on its motion, 5th national conference on mechanical and aerospace engineering, Tehran, Iran, Jun 13-14, 2020.
27. Numerical investigation of 2D synchronized swimming using the finite element method (FEM), Second National Conference on Micro/Nano Technology, Ghazvin, Iran, Sep 2020.

5- Developing National Standards as a member of board in national standard committee:

- 1- Particulate air filters for indoor ventilation applications, Standard number: ISIRI 14017, 2011.
- 2- Disposable Mask for clinical applications: requirements and test methods, Standard number: INSO 6138, 2012.
- 3- Protection against sharp objects: requirements and test methods, 2014.

6- Review experience:

1. Fuel and combustion journal
2. Review of Scientific Instruments (AIP Journal)
3. Journal of Computational Applied Mathematics
4. Scientia Iranica
5. International Journal of Engineering
6. Physics of Fluids (AIP Journal)
7. Energy Equipment and Systems
8. Transactions of the Institute of Measurement and Control
9. Energy and Fuels
10. : Journal of Micromechanics and Microengineering
11. Proceeding of institute of mechanical engineers: part E Journal of process mechanical engineering
12. Applied Thermal Engineering
13. Chemistry Researches
14. International Journal of Automotive Engineering
15. Journal of Physics: Part D: Applied Physics
16. Journal of Engineering and Technological Sciences
17. : Canadian Journal of Chemical Engineering
18. International Journal of Thermal Sciences
19. Journal of Thermal Analysis and Calorimetry
20. Bioprocess and Biosystems Engineering

7- Research interests:

- Experimental study of domestic and industrial combustion systems and development of advanced flame characterization techniques
- Design, fabrication, and experimental study of particle-containing systems for thermal and biological applications (Particulate flows in microflows)

8- Patents:

- An automated measurement system for PM10 particles using laser beam, Patent No. 773372, 2012.
- Particle Image Velocimetry (PIV) set up for open channels velocimetry, Patent No.92896, 2017.
- Experimental test bed for testing of premixed burners, Patent No. 1۳۹۷۵۰۱۴۰۰۰۳۰۰۰۱۹۳, 2019.

9- Funded Researches:

1. Design, fabrication and documentation of technical knowledge of a machine for particle detection and separation using laser, Funded by IDRO 2009-2011.
2. Research, design and fabrication of temperature measurement devices, funded by: Iran National Science Museum, 2016-2018.
3. Research, design and fabrication of velocity and flow measurement devices, funded by: Iran National Science Museum, 2017-2019.
4. Apparatus for performance and emission monitoring of burners, Iran National Elite Foundation, 2019-2020.
5. Performance map derivation of a premixed burner aimed at water heating system, 2019-present.
6. Apparatus for wireless molten steel temperature measurement, Iran National Elite Foundation, 2020-present.

10- Courses Taught:

Advanced Engineering Mathematics, Advanced Internal Combustion Engines, Advanced Engineering Thermodynamics, Advanced Measurement Systems and Laboratory

11- Scientific memberships:

- Combustion Institute (CI)
- Iranian Society of Mechanical Engineers (ISME)
- Iranian Society of Heating, Refrigerating and Air-Conditioning Engineers (IRASHARE)
- Iranian Society for Optics and Photonics (OPSI)

12- Graduate students supervised

35 MSc. Thesis supervised in the areas of microfluidics and combustion and 27 working
Ψ PhD. Thesis advised in the areas of microfluidics and combustion and 11 working

Date Updated: 06/06/2021 by Mohammad Zabetian Targhi