
Arvind Gangoli Rao

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Academic Background

- Academic Profile Director for Future of Transport, Delft Extension School (March 2021 onwards)
- Associate Professor, Faculty of Aerospace Engineering, Delft University of Technology (July 2014 onwards).
- Assistant Professor, Faculty of Aerospace Engineering, Delft University of Technology (Aug 2008 – June 2014).
- Postdoctoral Fellow, Turbo and Jet Engine Laboratory, Faculty of Aerospace Engineering, Technion, Nov 2005-July 2008.
- Ph.D. in Aerospace Engineering, Indian Institute of Technology- Bombay, March 2006
- Master of Technology (M.Tech) in Aerospace Propulsion, Indian Institute of Technology- Bombay, India, Jan 2001.
- Bachelor of Engineering (B.E.) in Mechanical Engineering, Dr. B.A. Marathwada University, Aurangabad, India, Aug 1998.

Areas of Interest

- New concepts in aircraft propulsion.
- Flameless Combustion and Gas Turbine Combustion.
- Heat Transfer :- jet impingement, gas radiation.
- Gas Turbine Engine, Design & Simulation.
- Aircraft Infrared Signature Modeling and Aircraft Susceptibility.

Teaching (At TU Delft) :

Courses

1. Aero Engine Technology (MSc course; 2011-present, 80+ students).
2. Combustion for Propulsion and Power Systems (MSc Course; 2018-present, 35 students)
3. Heat Transfer Problems in Gas Turbines (MSc course; 2010-2016, 25+ students).
4. Propulsion and Power (BSc course; 2011-2014; 500+ students).
5. Thermodynamics and Gas turbines (BSc course; 2009-2010).
6. Aircraft Design (BSc course; 2009-2010).

Supervision

1. Supervised more than 50 MSc students towards completing their MSc research thesis (54 ECTS).
2. Coach for Design Synthesis Exercise “Zero-Emission Remote Controlled Blended Wing Body” for a group of 10 bachelor students, 2009.
3. Tutor for Design Synthesis Exercise “AeroCity” for a group of 10 bachelor students, 2011.
4. Tutor for Design Synthesis Exercise “ Multifuel Blended Wing Body” for a group of 10 bachelor students, 2011. **This was awarded as 1st in the final symposium.**
5. Tutor for Design Synthesis Exercise “ Jumbo City Flyer” for a group of 10 bachelor students, 2012. **This was awarded as 1st in the final symposium 2012**
6. Tutor for Design Synthesis Exercise “ Euro Flyer” for a group of 10 bachelor students, 2013. **This was awarded 2nd in the final symposium 2013.**

7. Tutor for Design Synthesis Exercise “*A320-Alternative Fuel*” for a group of 10 bachelor students, 2014.
8. Tutor for Design Synthesis Exercise “*Aerocity 2.0*” for a group of 10 bachelor students, 2019.
9. Tutor for Design Synthesis Exercise “*A320-APPU*” for a group of 11 bachelor students, 2020.

Publications

Please see the attached list of publications.

Funded Projects

1. Auxiliary Propulsion and Power Unit (APPU, 2020-2023): Principal Investigator (Prof. Veldhuis as Co-PI). Partners: Safran Tech, Airbus and Rotterdam the Hague Innovation Airport. Total budget: 2.1 million Euros. [APPU \(tudelft.nl\)](http://tudelft.nl)
2. Concept validation study for fuselage wake-filling propulsion integration (2017-2020):- Work Package Leader: The project deals with concept validation of propulsive fuselage concept based on BLI. The project is sponsored by European Commission. TU Delft Budget: 800k Euros <https://www.centrelines.eu/>
3. *Advanced Hybrid Engine for Aircraft Development* (AHEAD, 2011-2015):- Coordinator of the project. Partners: WSK PZL-Rzeszow S.A (Poland), Technical University of Berlin (Germany), Deutsches Zentrum fuer Luft- Und Raumfahrt e.V (DLR, Germany), Israel Institute of Technology-Technion (Israel), Ad Cuenta b.v. (Netherlands). Funded by the European Commission. Total Budget of the project- 2.99 Million Euros. [\(http://www.ahead-euproject.eu/\)](http://www.ahead-euproject.eu/)
4. *Fundamental Investigations on Boundary Layer Ingestion* (2016-2017) : PI of the project: Sponsor: SAFRAN Tech (France): Total Budget of 40K Euros.
5. *Efficient System and Propulsion for Small Aircraft* (ESPOSA, 2011-2016): - this is an EU funded projects with around 40 partners from all over Europe. Role: Coordinator for TU Delft. Budget for TU Delft > 0.5 million Euros. Total project budget 35 million. [\(http://www.esposa-project.eu/\)](http://www.esposa-project.eu/)
6. *New Aero Engine Concepts* (2008-2012):- within the CleanEra group (www.cleanera.tudelft.nl), funded by the Aerospace Engineering Faculty of TU Delft.
7. *Enhanced Heat Transfer for Improved Operational Stability in Flameless Combustion for Gas Turbine Applications* (2007-08):- PI of the project. Funded by the Israeli Science Foundation.
8. *The Micro Turbine Cooler (MTC)* (2007-08)- A Novel Methodology for Cooling Microprocessors: - Project funded by Intel corporation to Prof. Levy.
9. *Flameless Oxidation for Gas Turbines* (2005-2007):- Funded by the ministry of Israel Council for Higher Education, Govt. of Israel.
10. *Infrared Signature Studies of Military Aircraft* (2002-2005):- Funded by the Aeronautical Research and Development Board to Prof. Mahulikar.

Invited Lectures/Talks

- “*Dual-fuel combustion principles and engine tech/arch challenges*” **Guest Lecture**: Safran Tech, 4th Nov 2020.
- “*Fundamentals of Gas Turbine Combustion*” **Guest Lecture**: Pimpri Chinchwad College of Engineering, 18th June 2020,
- “*Fundamentals of Aircraft Propulsion*” **Guest Lecture**: Pimpri Chinchwad College of Engineering, 17th June 2020,

- “*Energy Transition in Aviation: The Role of Cryogenic Fuels*” **Workshop on Fuels Processes and Combustion Physics in Energy Transformation**: Physikzentrum Bad Honnef, 8-12th March 2020,
- “*A Possible Role for Cryogenic Fuels in Civil Aviation*” **Lunch Lecture e-Refinery**: 7th Jan 2020,
- “*Possible Alternative Fuels and Propulsion Systems for Civil Aviation*”, **TU Delft Alumni Meeting: Hamburg Chapter**: 7th Nov 2019.
- “*New Aircraft and Engine Configurations*”, **KLM Innovation and Sustainability Workshop**, Madrid, 30th Oct 2019
- “*A look at current and future aircraft propulsion systems*”, **KIVI Mini-symposium Vliedschaamte**, Den Haag, 17th Sept 2019
- “*Technologies for a sustainable aviation*”, **Kinder conversations**, Amsterdam, 17th June 2019
- “*Can we make Aviation Sustainable?*”, **Rotary Club**, Delft, 15th March 2019
- “*A Novel Aircraft and Engine for Future Civil Aviation*”, **Seoul National University**, 17th Dec 2018.
- “*Electric aviation: hype or reality?*” **Electric and Hybrid Aerospace Technology Symposium**: Koln, Germany, 08-09 November 2018.
- “*How Combustion made us Human*” **COMBURA Symposium**, Soesterberg, Netherlands; October 9-10.
- “*Can we make Aviation Sustainable?*” **Vliegtuiggebruikstechnologie forum**; Schiphol, Netherlands, 19th Nov 2018.
- “*Advanced Hybrid Engines for Aircraft Development*”, **Seoul National University**, South Korea, 17th December 2018.
- *Evolution of Aircraft Engines & Current Challenges*: **IIT Bombay**, Mumbai, 13th Aug 2018.
- *Hybrid Combustion System for Future Aircraft Engines*: **Indian Institute of Sciences**, Bangalore, 16th July 2018.
- *Hybrid Combustion System for Future Aircraft Engines*: **KAUST Research Conference: Combustion in Extreme Conditions**, Bangalore, 16th July 2018.
- *Gas turbine emission modeling using CFD with chemical reactor networks*; **ERC OFTAC Course on Best practices guidelines for CFD of turbulent combustion including emission prediction and virtual prototyping**. 11-12 Dec 2017.
- *Boundary Layer Ingestion for Civil Aircraft*, 6th International Symposium on Jet Propulsion and Power Engineering, **Beihang University**, 17-18 Oct 2017.
- *AEROCITY: The new mode in transportation*: **World Transportation Conference**, 5th & 6th of July, Koln.
- *Experimental Assessment of Boundary Layer Ingestion*: 3rd **Bauhaus Luftfahrt Symposium**, 31st May -1st June, 2017, Munich, Germany.
- *Exploratory Assessment of a Dual Fuel A320*: **Forum-AE** technology meeting, CO₂ mitigation technology workshop, 10th and 11th of May 2017, Reims, France.
- *The Climate and Economic Assessment of a Multi-Fuel Blended Wing Body* : **Greener Aviation Conference**, Brussels, 12th Oct 2016
- *AHEAD: The Multi-fuel Aircraft and Engine* : **Electric and Hybrid Aerospace technology Symposium**, Bremen, 17-18 Nov 2015.
- *Paving the way for next generation aircraft and engine* : **Aerodays 2015**, London, 19-22 Oct 2015.
- “*Hybrid Combustion for future Aero Engines*”, **COMBURA conference**, 8th October 2015, Soesterberg.
- “*Hybrid Combustion for Aero Engines*”, Workshop on Combustion, 25th February 2015, **IIT Mumbai**.
- “*The AHEAD Multi-Fuel Blended Wing Body Aircraft*”, **NLR Amsterdam**, 26th January 2015
- “*Effect of Jet A1-LH2 Hybrid Combustion on non-CO2 emissions*”, **Sustainable Aviation Fuels Forum**, 20-22 October 2014, Madrid, Spain
- *AHEAD Project Results*: **Forum-AE Technology Meeting**, 1st & 2nd July 2014 in Paris, France.

- *AHEAD – Advanced Hybrid Engines for Aircraft Development*: Enabling and promising technologies for achieving the goals of Europe's Vision Flightpath 2050 26-27 September 2013, **Cranfield University**
- *AHEAD: A step change in Aviation* : **TU Delft Gas Turbine Symposium**, 17th May 2013.
- *New Engine Architecture for Future Aircraft* : **EASN workshop**, 31st Oct-2nd Nov 2012.
- *EFRA: Environmentally FRiendly Aircraft* : **EASN workshop**, 31st Oct – 2nd Nov 2012.
- *Aero Engine Technology* : **InHolland**, 11th Oct 2012.
- *Advanced Hybrid Engine for Aircraft Development* : **IIT Bombay**, 13th Aug 2012.
- *Getting AHEAD* : Bevestiging workshop KP7 Aeronautics & Air Transport, 25th May 2011.
- *The AHEAD project*: **DGTA Technical Meeting**, 19th May 2011.
- *Sustainability in Aviation* : Talk organized by BeNelAir, 25th Jan 2011.
- *Philosophy of Aircraft Propulsion*: Short course for **COMAC**, 29th Oct 2010.
- *Introduction to Gas Turbines*: Short course for **Siemens** master class 25th Aug 2010.
- *Alternative Fuels in Aviation*: **Dutch Gas Turbine Association**, April 2010.
- *Aircraft IR Signatures*:- **Dutch Air Force** head quarters, Breda, 27th Nov 2009.
- *Flameless Combustion, an Evolution in Gas Turbine Combustion*:- **COMBURA** 2009, 16th Oct 2009, Nieuwegein, The Netherlands.
- *Infrared Signature Modeling of Military Aircraft*:- **TNO** Hague, 24th Nov 2008.
- *Infrared Signature Modeling of Aircraft Exhaust Plume*:- 7th Israeli Jet Engine and Gas Turbine Engine Symposium, **Technion**, Israel, 6th Nov 2008.
- *Aircraft Infrared Signatures*:- **Israeli Military Industries (IMI)** Israel, 8th Feb 2006.
- *Research Scenario in IITs*:- National Seminar on Science Policy, Implementation and Assessment, **Bhabha Atomic Research Center**, 2nd Nov 2004.
- *Overview of Infrared Signature Analysis for Aircraft*:- IL-76/78 Tetra School, **Indian Air Force**, Agra, 9th November, 2004.
- *Infrared Signatures of Aircraft*: - **HAL Engine Division**, Koraput, 28th September, 2004.
- *Overview of Aircraft Engines*: - **Inst. of Aeronautical Engg**, Hyderabad, 6th July 2004.
- *The World of Aviation*: - **Nehru Science Center**, Mumbai, 13th Sept. 2003.

International Collaborators

- Prof. Dr. Ing. Oliver C. Paschereit; Chair of Fluid Dynamics - Hermann-Föttinger-Institute (HFI), Technische Universität Berlin, Germany.
- Dr. Volker Grewe; DLR-Institut fuer Physik der Atmosphaere, Oberpfaffenhofen, Germany.
- Prof. Yeshayahou Levy; Faculty of Aerospace Engineering, Technion, Israel.
- Dr. Jörg Sieber; MTU Aero Engines GmbH; Munich, Germany.
- Robert haligowski; EU R&T Director; WSK “PZL-RZESZOW” S.A, Poland
- Prof. S.P. Mahulikar; Department of Aerospace Engineering, IIT Bombay, India.
- Prof. Ephraim J. Gutmark, Professor of Aerospace Engineering & Engineering Mechanic; University of Cincinnati; USA.
- Dr.-Ing. Eberhard Nicke; Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Koln, Germany.

Referee for International Journals

Below are the journals which ask me to review papers on a regular basis

- Aerospace Science and Technology
- Applied Energy
- Applied Thermal Engineering
- Chinese Journal of Aeronautics
- Energy Conversion and Management
- Energy & Fuels
- Energy
- International Journal of Turbo and Jet Engines
- Journal of Aerospace Engineering

- Journal of Aircraft
- Journal of Combustion
- Journal of Engineering for Gas Turbines and Power
- Journal of Intelligent Material System and Structures
- Journal of Propulsion and Power
- Journal of Turbulence
- Proceedings of The Combustion Institute
- Measurement

Awards and Affiliations

- Listed in 2019 Mandelely top 2% scientists in 2019. Ioannidis JPA, Boyack KW, Baas J (2020) Updated science-wide author databases of standardized citation indicators. PLoS Biol 18(10): e3000918. <https://doi.org/10.1371/journal.pbio.3000918>. Data can be accessed by <https://doi.org/10.17632/btchxktzyw.2#file-dd0904a8-0eba-4cf3-be4a-c6092261fed5>
- Best Review Paper Award for the paper “Infrared Signature Studies of Aerospace Vehicles” IIT Bombay, 2009-10.
- Post-doctoral fellowship, Israeli Ministry of Higher Education, 2005-2007.
- Best Research Scholar, IIT Bombay 2004-05.
- Best Office Bearer, Research Scholar’s Forum, IIT Bombay, 2003
- National Representative for ISABE : International Society for Air Breathing Engines.
- Member of the ACARE (Advisory Council for Aeronautics Research in Europe) committee WG3 (Energy and Environment) 2011-12.
- Member of the aircraft engine committee for IGTI, International Gas Turbine Institute.
- Member of the Dutch Gas Turbine Association.
- Member of the editorial board “International Journal of Turbo and Jet Engines” from Freund publishing house.
- Life Member, Aeronautical Society of India.

Current PhD Candidates

1. Sumit Tambe: Aerodynamic Interaction of Non-Uniform Inflows and Transonic Fan.
2. Biagio Della Corte: Numerical and Experimental Investigation of Boundary Layer Ingestion for Civil Transport Aircraft.
3. Rishikesh Sampath: Fundamental Investigations of Flameless Combustion in a Laboratory Scale Gas Turbine Combustor.

Past PhD Candidates

1. Andre A.V. Perpignan : Emission Modelling from a Multi-Fuel Dual Combustor Gas Turbine (defended 5th March 2020)
2. Peijian Lv : Theoretical and Experimental Investigation of Boundary Layer Ingestion for Aircraft Application (defended 23rd April 2019)
3. Feijia Yin: Modeling and Characterization of a Novel Hybrid Engine for Future Aircraft Propulsion (defended on 13th Sept 2016)
4. Dipanjay Diwanji: Flow Characteristics in Lean Direct Injection Combustors (defended successfully on 15th Oct 2012).

Administrative Responsibilities

- Chairman of the external review committee for evaluating CleanSky JU
- Project lead from TU Delft in the Centreline Project (<https://www.centreline.eu/innovation/>)
- Profile coordinator of Propulsion and Power MSc track in TU Delft
- Coordinator of the EU Sponsored AHEAD project 2011-2014 (<http://www.ahead-euproject.eu/>)

- Member of the aircraft engine committee for IGTI, International Gas Turbine Institute
- National Representative for ISABE society.
- Member of the ACARE (Advisory Council for Aeronautics Research in Europe) committee WG3 (Energy and Environment)
- Principle point of contact for the ESPOSA project 2011-2015.
- Initiator and organizer of the Annual TU Delft Gas Turbine Symposium.
- Hosted Prof. Yeshayahou Levy from July 2011 to Sept 2011 in TU Delft.
- Senate Member IIT Bombay 2004-05.
- Member, Post Graduate Planning Committee (PGPC), IIT Bombay 2004-05.
- Member, Library Committee, IIT Bombay 2004-05.
- Represented IIT Bombay in International Association for Human Values, summit in Bangalore, Dec 2003.
- General Secretary Hostel-1, IIT Bombay 2002.
- System Administrator for Aerospace Propulsion Computer Lab, IIT Bombay

Languages

- English : C2
- Dutch : B1
- Hebrew : A2
- Hindi : C2
- Urdu : B2
- Marathi : B2
- Kannada : B1
- Punjabi : A2
- Konkani : C2

Nationality: Indian

I hereby declare that the above-mentioned information is true to the best of my knowledge



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Date: 20th Nov 2020
Place: Delft, Netherlands