



Indian Institute of Technology Madras
Office of Alumni and Corporate Relations



***CELEBRATING THE
GENEROSITY OF
Mr. Thomas Alexander***
**Impact of your giving in
2023**

AUGUST 2023

Message from Director



Prof. KAMAKOTI VEEZHINATHAN
Director, IITM

Greetings !

IIT Madras continues to retain her top position for the eighth consecutive year, in the National Institute Ranking Framework, thanks to the world-class research of its faculty and students. The contribution and support of Alumni and well-wishers like you has crucially helped this standing and stature. Our achievements in research, education, innovation and entrepreneurship have also earned us the recognition of an 'Institute of Eminence' as well as the top position in the Atal Innovation Ranking from the Government of India.

The institute is making an indelible mark with her 'research with impact' in several areas including quantum computing, drinking water technology, industrially relevant mathematical models for governance, rendering cancer-cure more effective. Our centres of excellence, the Center for Innovation, Nirmaan – the pre-incubator, the Incubation Cell, technology centres such as 'IITM-Pravartak' and others, work in unison for not just our nation's building, but societies world-wide. We aspire to be locally impactful and globally relevant through all these efforts.

Towards exploring new research frontiers, a Department of Medical Sciences and Technology has been launched to conjoin medicine and engineering. Similarly, a School of Sustainability is on the horizon to research sustainable practices in the Global South. The campus is moving towards 'carbon-net-zero' goal through water conservation by 100% recycling, efficient garbage disposal, and electrification of vehicles. The traditional education system is undergoing a paradigm shift, with our online Bachelor of Science programme in Data Sciences and the National Program of Technology Enhanced Learning, that have won Gold in the 'Lifelong Learning' category and Silver in the 'Best Online Program' category of the Wharton-QS Reimagine Education Awards 2022 respectively. IIT Madras is leading this revolution from the front.

Such achievements are not possible without the deep-rooted faith and support of alumni and well-wishers such as yourself. We are indebted to you for your generous, bountiful, and impactful contributions. On behalf of IIT Madras, I offer you our deepest gratitude for continuing to strengthen the Institute. Together with your support, we are confident of building an IIT Madras that is more inclusive, diverse, and enabled by an ecosystem to be nationally relevant and globally recognised. **Thank you !**

Message from Dean



Prof. MAHESH PANCHAGNULA
Dean, Alumni & Corporate Relations,
IITM

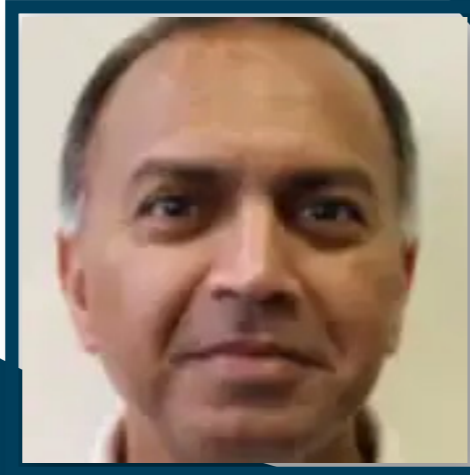
I express my heartfelt gratitude to you for your generous support to IIT Madras. We appreciate your passion in supporting the causes you do and I assure you that your contributions will be optimally utilised. This report has been compiled to convey how your largesse has touched lives and made a difference at IIT Madras. In keeping with the rapid, contemporary strides in science, technology we have set ambitious goals for ourselves - your continued enthusiasm and support will help us greatly in these endeavours.

IIT Madras is far more diverse in its set of pursuits, more green and more research-focused. And yet, it remains unchanged over these years, it is still the best Institute in the country, and attracts the best students that India has to offer to come and make a mark. I also cordially invite you to visit your campus to see for yourself, the impact of your contribution, and the growth and transformation the Institute has undergone over the years.

We can never express our gratitude enough for all that you have done - **Thank You !**



“Thank you for your support and for your belief in doing good. We simply couldn’t do what we do without amazing people like you.”



Mr. Thomas Alexander

CEO at Uplevel Systems Inc

He has played a pivotal role in launching five companies thus far, predominantly in the technology sector, with his latest venture being Uplevel Systems. Notably, his previous two ventures were successfully acquired. Over the course of his career, he has taken on various key roles such as CEO, CTO, Principal Architect, among others, across multiple enterprises. His versatile skill set includes crafting business strategies, overseeing business and engineering management, facilitating angel and Series A funding rounds, and guiding these companies through subsequent funding rounds until their successful exits.

Mr. Thomas Alexander is not only an accomplished Angel Investor and Growth Investor but also a passionate mentor to numerous aspiring young entrepreneurs and their projects. We take immense pride in showcasing the remarkable impact of projects supported by Mr. Thomas Alexander.

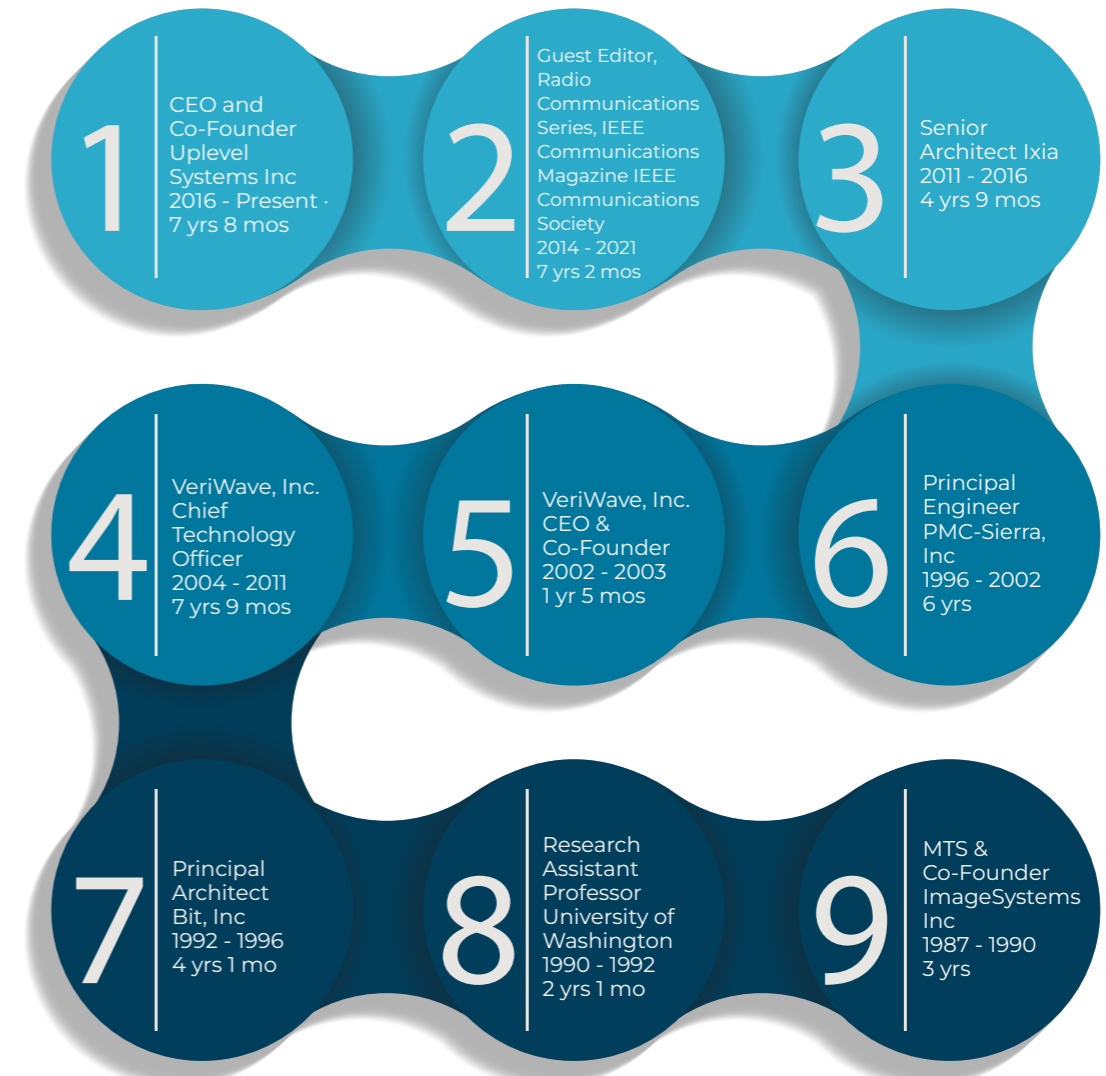
Education Roadmap

Indian Institute of Technology, Madras
B. Tech, Electrical Engineering
1979 - 1984

University of Washington
MSEE, Electrical Engineering
1984 - 1986

University of Washington
PhD, Computer Engineering
1986 - 1990

His Journey Since IITM



Summary of your contribution

Prof. Malathi Veeraraghavan Scholar Fellowship Program

N. T Alexander Institute Chair

Prof. Malathi Veeraraghavan Scholar Fellowship Program & Undergraduate Prize

6 recipients of the grant over 3 years (2020 - 2023)

MVR Scholar Fellowship Program
(2020 - 2022)

MVR Undergraduate Prize
(2021 - 2023)



Sriprabha
(2022)



Aakanksha
(2021)



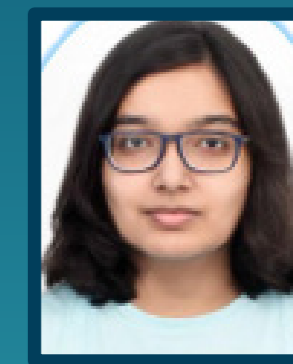
Lakshmi Areekath
(2020)



Srilakshmi
(2023)



Shatakshi Sarangi
(2022)



Shivangi Singh
(2021)



[Click here to view the detailed report](#)

NT Alexander Institute Chair



Prof. Shanthi Pavan

NT Alexander Institute Chair Professor
Department of Electrical Engineering, IIT Madras

Institute Chair Professorship in Department of Electrical Engineering, IIT Madras

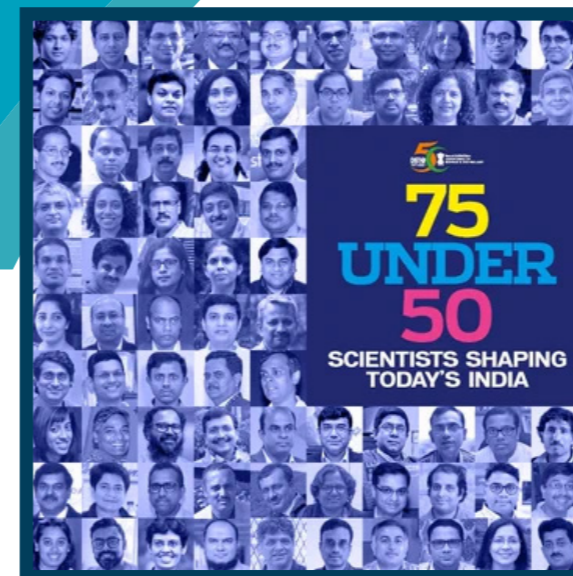
Chair Professorships are awarded to Professors who have distinguished themselves and been recognized by their peers for their research and/or technology development. This award is for a period of 5 years (up to end of March 2025) followed by a review and possible extension. We received generous contributions from three different donors and a significant giving by Mr. Thomas Alexander for the NT Alexander Institute Chair Professor. Mr. Thomas Alexander and his sister Ms. Elizabeth Alexander who is also an alumna of IIT Madras have instituted this chair in memory of their father. Who himself was an electrical Engineer.

Prof. Shanthi Pavan is currently the Dean of Academic Research.

He was awarded the first NT Alexander Institute Chair Professorship in April 2021.

Awards and Honours

Fellow, Indian National Science Academy, 2023



Prof. Shanthi Pavan, Dean Academic Research, @iitmadras, was featured in the book titled "75 under 50: Scientists Shaping Today's India". Union Minister of State Science & Tech, Shri. Dr. Jitendra Singh released it on National Science Day on March 2022.

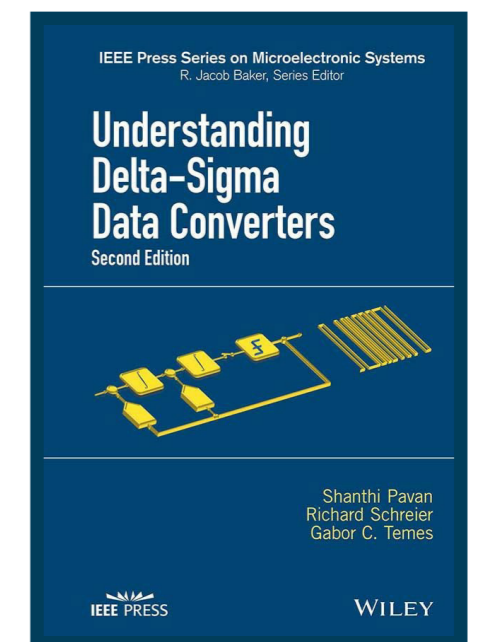


Recent Journal Publications

1. S.Pavan and G.Temes, ``Reciprocity and Inter-Reciprocity: A Tutorial - Part I: Linear Time-Invariant Networks" IEEE Transactions on Circuits and Systems: Regular Papers , to appear in 2023.
2. S.Pavan, S.Manivannan and N.Basavaraj, ``Analysis and Design of Wideband Filtering ADCs Using Continuous-Time Pipelining" IEEE Journal of Solid State Circuits , to appear in 2023.
3. R.Theertham, S.Ganta and S.Pavan, ``Design of High-Resolution Continuous-Time Delta-Sigma Data Converters With Dual Return-to-Open DACs" IEEE Journal of Solid State Circuits , November 2022.
4. N.Basavaraj, S.Manivannan and S.Pavan, ``Simplified Simulation and Measurement of the Signal Transfer Function of a Continuous-Time Pipelined Analog-to-Digital Converter" IEEE Transactions on Circuits and Systems: Express Briefs , May 2022.
5. S.Manivannan and S.Pavan, ``Improved Multistage Continuous-Time Pipelined Analog-to-Digital Converters and the Implicit Decimation Property" IEEE Transactions on Circuits and Systems: Regular Papers , August 2022.
6. S.Pavan, ``Systematic Development of CMOS Fixed-Transconductance Bias Circuits" IEEE Transactions on Circuits and Systems: Express Briefs , May 2022.
7. S.Pavan and S.Manivannan, ``Analysis of RC Time-Constant Variations in Continuous-Time Pipelined ADCs" IEEE Transactions on Circuits and Systems: Regular Papers , February 2022.
8. R.Theertham and S.Pavan, ``Alias Rejection in CT Delta-Sigma ADCs Using Virtual-Ground-Switched Resistor Feedback" IEEE Transactions on Circuits and Systems: Express Briefs , March 2022.

“Understanding Delta-Sigma Data Converters” Named Outstanding Professional Book

The publication is the first to receive this recognition from Wiley-IEEE Press



The annual award was established this year to honour the best professional book published in the last three years by Wiley-IEEE Press in a field relevant to IEEE.

The Wiley-IEEE Press publishes books and reference works for the engineering and computer science communities.

The authors are IEEE Fellows Shanthi Pavan, Richard E. Schreier, and Gabor Temes. The book covers an important technique used to convert analog signals into digital form—according to a member of the awards committee.

This is an “outstanding book and deserves to be honoured as the inaugural recipient,” According to another member of the award committee “The book is a comprehensive, yet reliable resource that encompasses both theory and application details. The authors have an engaging and accessible style, but they don’t shirk on technical depth. The book was clearly a labour of love for the authors, and it shows.”

About the Authors



From left: Gabor Temes, Shanthi Pavan, and Richard Shreier

PHOTOS: SHANTHI PAVAN; PADDY DUNCAN

Pavan is an Institute Chair professor of electrical engineering at the Indian Institute of Technology Madras, in Chennai. He has served as the editor-in-chief of the IEEE Transactions on Circuits and Systems. Pavan also serves on the editorial boards of the IEEE Solid-State Circuits Letters and the IEEE Journal of Solid-State Circuits. He is a Fellow of the Indian National Academy of Engineering.



PROF. SHANTHI PAVAN Surging Ahead

When Prof. Shanthi Pavan's class IXth chemistry teacher gave him the task of explaining the manufacturing and properties of sulphuric acid to the entire class, the joy a successful lesson brought to him made him realize that he enjoyed teaching. Prof. Shanthi Pavan grew up in Bangalore, where his father, Gopala Rao, worked as an electronics engineer and his mother, Uma, was a homemaker.

Prof. Shanthi Pavan, the NT Alexander Institute Chair Professor of Electrical Engineering at IIT-Madras, works in the area of analog and mixed-signal integrated circuit (VLSI) design. It was during his BTech at IIT-Madras that he was introduced to the area of analog electronics. In the early nineties, the analog area was not popular as everyone believed that the whole world was going digital (DSP chips were introduced in the mid-1980s). In fact, most American universities had rid their curricula of analog courses. Fortunately, IIT-Madras had outstanding faculty members in this area in the form of Prof. Anthony Reddy and Radhakrishna Rao, who ran a sequence of excellent analog courses. Shanthi was smitten, and could not but resist from going into this area. After the BTech, he went to Columbia University, New York, for his doctoral degree. There he worked with Prof. Yannis Tsividis, a pioneer in the area and a professor of worldwide repute. Meanwhile, in the late nineties, the mobile-telephony and internet boom began to take root, and analog electronics suddenly became immensely popular in demand.

Prof. Shanthi Pavan returned to his alma-mater in 2002 after a five-year stint in the VLSI industry in various companies in the US. The opportunity to be part of the IIT-Madras faculty was too good to forego. However, VLSI design needed expensive computing and CAD tools, as well as funds to fabricate chips and equipment for measuring them. Research funding was scarce. This changed soon and research funds became increasingly easily available from 2005 onwards. The thrust of the government to

“
Chips don't
lie - if you are
sloppy, your
silicon will not
work.”



improve the prevailing talent pool in the VLSI area also helped matters. Slowly but surely, a group, under Prof. Pavan's tutelage, of analog mixed-signal IC design emerged and soon acquired a worldwide reputation for its quality of teaching and research.

A major thrust in Prof. Shanthi Pavan's research has been the design of high-performance analog-to-digital converters or ADCs. A technique of realizing ADCs, called delta-sigma data conversion, has been the subject of much of Prof. Shanthi Pavan's research. Delta-sigma ADCs are the workhorse of modern mixed-signal electronics. They are used virtually everywhere, ranging from sensor front-end electronics to wireless transceivers. A smart phone is estimated to employ more than a dozen such ADCs to make sense of real world signals. Such signals, which are analog in nature, need to be converted into digital form, so that they can be stored and processed by a digital signal processor (DSP). Extending battery life of portable electronics is critical and is the driver for low power electronic components.

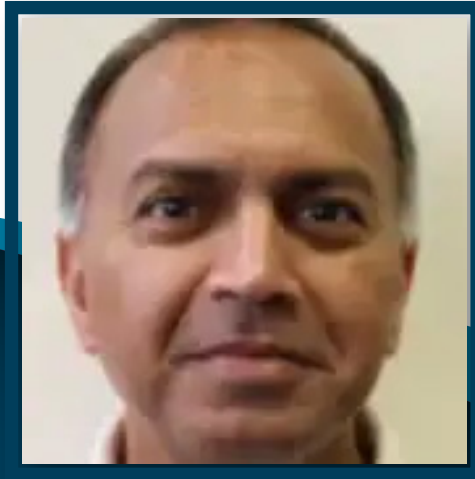
Researchers are, therefore, always attempting to achieve better performance with a lower power dissipation. ADC design is thus not only an intellectual challenge, but also immensely relevant in practice.

One of Prof. Shanthi Pavan's important contributions is the book 'Understanding Delta-Sigma Data Converters' (2nd Edition, along with Richard Schreier and Gabor Temes). It is the 'standard' textbook in the area

He is known for his studies on mixed signal VLSI circuits and is an elected fellow of the Indian National Academy of Engineering. He is also a fellow of IEEE. The Council of Scientific and Industrial Research, the apex agency of the Government of India for scientific research, awarded him the Shanti Swarup Bhatnagar Prize for Science and Technology, one of the highest Indian science awards for his contributions to Engineering Sciences in 2012.

His [website](#) encapsulates his various activities in teaching, research, publications, opportunities, awards and honours and his Bio.

WE ARE GRATEFUL TO YOU!



Mr. Thomas Alexander, Ms. Elizabeth Alexander and other family members

Thank you for your sustained generosity to IIT Madras over the years. Contributors such as yourself enable our students and Professors to dream big and work towards a better and brighter future. We hope you are proud of your alma mater and how it has remained steadfastly committed to academic and research excellence since your time here. You and your family have been instrumental in facilitating this significant growth.

Our efforts to nurture the culture of academic excellence that is the hallmark of IIT Madras - quality education, cutting-edge research, and unfettered creativity shall continue. We are privileged and humbled to have you and your family walking with us along this trail. We wish you and your family the best always in all walks of life!



Indian Institute of Technology Madras, Chennai – 600 036

www.iitm.ac.in

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Office of Alumni & Corporate Relations
T: +91-44-2257 8390 | <https://acr.iitm.ac.in/>

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