VENKATESAN R

Vazhmangalam | Nagapattinam- 609703 |Tamilnadu| India|Email: venkey406@yahoo.com | Mobile: +91 9789312011

Ph.D. Nano electronics and MEMS | Device optimization and fabrication of CNT-TFTs for FPD applications | Three 1st authored Peer-Reviewed Journal Articles | Mentored undergrad students | Visvesvaraya PhD fellowship scheme (MEITY-PHD-1809) (2016-2022) | Knowledge in preparing project proposals

SKILLS

Instrumentation / Tools (Fabrication)

Sputtering unit | Thermal Evaporator (Metal coating) | Oxidation Furnace | Spin Coater| Spray Pyrolysis

Software:

COMSOL | Clewin (photomask layout) tool | MATLAB (data analysis and parameter optimization) | Origin | MS Word and Excel

RELEVANT COURSEWORK

Semiconductor devices and modeling

- The course was a study of properties and characterization of semiconductor material and to calculate the electrical and material properties

MEMS Design and Fabrication

- The course was a study of MEMS sensors and devices, Semiconductor material properties, and Fabrication techniques

EDUCATION

Doctor of Philosophy (Ph.D)* **[Electronics and Instrumentation Engineering]** [*May 2016–June 2022*]

Nano electronics and MEMS,

Dissertation: "Simulation and design optimization of CNT-TFTs for large flat panel display applications and their electrical characterization"

NPMaSS MEMS Design Centre (NMDC),

Annamalai University, Tamilnadu.

Master of Technology (M.TECH) [*Aug 2009 – Mar 2011*]

Nano Electronics

SASTRA University, Thanjavur, Tamilnadu.

Bachelor of Technology (B.TECH) [*Aug 2005 – March 2009*]

Electrical and Electronics Engineering (EEE)

Pondicherry University, Bharathiyar College of Engineering and Technology, Karaikal, Puducherry.

*** Pursued Ph.D through "Visvesvaraya Ph.D scheme for Electronics and IT" which is an initiation of Ministry of Electronics and Information Technology, Government of India with an objective to enhance the number of PhDs in Electronics System Design & Manufacturing (ESDM) and IT/IT Enabled Services (IT/ITES) sectors.**

RESEARCH SUMMARY

PRESENT WORK (Ph.D)

Currently, working on the **carbon nano tube thin film transistor (CNT-TFT)** where CNT act as semiconductor channel layer in **Thin Film Transistor** for Flat Panel Display (FPD) applications. The one-dimensional nature of CNTs allows electrons to flow in a ballistic manner, resulting in high mobility which eliminates the short channel effects, decrease in threshold voltage, and parasitic resistance effect that occur when channel length is reduced in conventional silicon devices. Objectives of the present research are stated as follows,

- To study the effect of CNT- TFT device geometries and CNT parameters on the electrical performance of CNT-TFTs by simulation experiments
- To optimize the device parameters and design CNT-TFT to achieve with the best possible performance and safe operation at room temperature.
- To fabricate the CNT-TFT using low temperature, solution based spin coating technique.
- To characterize the fabricated CNT-TFT device and to measure its electrical characteristics.

  Thesis title: Simulation and Design optimization of CNT-TFTs for large Flat Panel Display applications and their electrical characterization.

PREVIOUS RESEARCH (M.Tech)

Fabrication and characterization of polyaniline (PANi) thin films for gas sensor applications. PANi thin films were thermally evaporated and their surface characterizations were studied. The change in resistance in exposure of carbon monoxide and ammonia gases is measured and reported.

PUBLICATIONS

1. **Venkatesan, R., Daniel, R.J. & Shanmugaraja, P (2019).** Simulation studies on effect of CNT physical parameters on carbon nanotube thin-film transistors (CN-TFTS). ISSS J Micro Smart Syst 8, 135–141. https://doi.org/10.1007/s41683-019-00045-x

2. **Venkatesan, R., Joseph Daniel, R. & Shanmugaraja, P(2021).** Optimization of CNT and TFT Parameters for Maximum Transconductance and Safe Temperature Operation of Carbon Nanotube Thin-Film Transistors (CNT-TFTs) Employed in Flat Panel Displays. Trans. Electr. Electron. Mater. 22, 47–56. https://doi.org/10.1007/s42341-020-00216-w **(IF:1.563)**

3. **Vijay M.Moorthy, R.Venkatesan & Viranjay M.Srivastava**. Optimiztion of Double-Gate Carbon Nanotube FET Chaeacteristics for Short Channel Devices. Recent Patent on Nanotechnology. (Under review)

4. **Venkatesan, R., Joseph Daniel, R. & Shanmugaraja, P.** Studies on effect of CNT physical parameters and CNT-TFT geometries on drain current, temperature and CNT-TFT design for optimum performance. (Manuscript under preparation).

5. **Venkatesan, R., Joseph Daniel, R. & Shanmugaraja, P.** Fabrication of Single Walled Carbon Nano Tube Thin Film Transistor (SWCNT-TFT) by room temperature solution processed spin coating method and characterization. (Manuscript under preparation).

International Conferences:

1. **Venkatesan R, Joseph Daniel R, Shanmugaraja P(2018).** 'Simulation studies on effect of CNT physical parameters on carbon nanotube thin film transistors (CN-TFTS)', 9thISSS National Conference on MEMS, Smart Materials, Structures and Systems, October 05&06, Thiagaraja college of Engineering, Madurai, India

2. **Venkatesan R, Joseph Daniel R, Shanmugaraja P(2018).**'Device characteristics of carbon nano tube thin film transistors with submicron channel lengths', National conference on Recent trends in Material Science (RTMS2018),December 19&20, Annamalai university, Annamalai Nagar,India.

Workshop Attended:

- INUP Familiarization Workshop on *Nanofabrication Technologies*, May 22-24, 2017, IIT Bombay
- National workshop on *Recent Advancements in Nanotechnology [RAN 2017]* at NIT, Puducherry.
- Participated *8th ISSS National conference on "MEMS, Smart Materials, Structures & Systems*" conducted at IIT Kanpur (2016)

RESEARCH INTEREST

- NEMS/MEMS devices modeling
- Device fabrication and Characterization
- Flexible electronic devices
- Nano and MEMS Sensors

PROFESSIONAL EXPERIENCE

Assistant Professor (Grade II) [*July2022 – till date*]

Department of Biomedical Engineering,
E.G.S.Pillay College of Engineering (Autonomous),
Anna University,
Tamil nadu, India

Courses Handled:

1. **Nanotechnology in medicine**
2. **Diagnosis and therapeutic equipment's (I&II)**
3. **Biometric systems**
4. **Advanced microprocessors and its applications**

Positions Held:

1. **NAAC & NBA coordinator (Criterion 6)**
2. **Exam cell in charge**
3. **Department Internship ana R&D coordinator**

Assistant Professor [*May 2011 - May 2016*]

Department of Electrical and Electronics Engineering
R.V.S College of Engineering & Technology,
Pondicherry University,
Puducherry, India

Courses Handled:

1. **Nano materials**
2. **Electronic devices**
3. **Microprocessors**
4. **Semiconductor Devices modeling**
5. **Electronic circuits**

Positions Held:

1. **Nodal officer in examination wing**
2. **Member in college academic board**
3. **Assistant placement officer**

PERSONAL DETAILS

Father's Name	:	R.Rethinasamy
Date of Birth	:	12-Nov-1986
Age	:	35
Address	:	3/144 third cross, Pudhupattinam nagar, Vazhmangalam, Nagapattinam-609606 Tamil nadu, India.
Marital Status	:	Married

REFERENCE

Dr. R. Joseph Daniel, (IIT-M)
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National MEMS Design Center (NMDC),
Department of Electronics and Communication Engineering,
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