Curriculum Vitae

Name: Asisa Kumar Panigrahy

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Address:
Flat No. 107, Giridhari Ishta Apartment,
Dargaha Khaliji Khan,
Kishmatpur Road, Hyderabad-500086,
Telangana, India.

Objective:

- Looking forward to build my career by utilizing all opportunities to implement my skills and knowledge in order to pursue a long term relationship with the organization.

- To explore new research area and to have an interesting research career with a wide task and variety that will provide excellent opportunities to learn new scientific facts and will bridge science with social welfare.

Research Interests:

Nanofabrication techniques, Device Simulation, VLSI and Nano-material based sensors, Vertical (3D IC) integration.

Teaching Interests:

Basic electronics, Electronic Devices and Circuits, Digital electronics, Digital Signal Processing, Physics of semiconductor devices, VLSI design, Microelectronics, Nanofabrication and Wafer Technology, Digital Signal Processors and Architectures.

Education:

1. **Ph.D.** (Electrical Engineering- **Microelectronics & VLSI**) from Indian Institute of Technology Hyderabad, Telangana, **August 2017**.

   Ph.D Thesis: Low temperature, Low Pressure and Fine pitch Cu-Cu thermo-compression bonding for Three Dimensional Integration Applications.

2. **M. Tech. (**VLSI & Embedded System Design) from B.P.U.T, Odisha, 2012. **(9.31 CGPA, 88.1%).**

   M.Tech Dissertation: Design of Low Power LDPC Decoder for High-speed wireless LAN using FPGA.

   Tools Used: XILINX, System Generator, MATLAB.

3. **B.Tech.** (Electronics & Communication Engineering) from National Institute of Science & Technology, Berhampur under B.P.U.T, Odisha, 2010. **(8.67 CGPA, 81.7%).**

   Major Project: Evaluation of coupling losses in Photonic crystal fibre for gas sensing application.

   Tools Used: MATLAB.

4. **Diploma** (Electronics & Telecommunication Engineering) from S.M.I.T., Berhampur under S.C.T.E & V.T, Odisha, 2006. (**85.47%**)

Work Experience: 5.5 Years

1. I have worked as an Assistant Professor from 1st July 2012 to 30th June 2013 in the Department of Electronics & Communication Engineering at **National Institute of Science & Technology, Berhampur, Odisha**.

- Taught several undergraduate Theory and Laboratory modules that included Basic Electronics, Analog Electronics Circuit, Hardware Description Language, VLSI Design and Digital Electronics Circuit.

- Actively participated in several volunteer efforts and became an active member of the 'Community Development Program' mission of the institute.

2. I have worked as an **Associate Professor** in the Department of Electronics & Communication Engineering at **KL University** from 19th June 2017 to 3rd May 2018.

3. Currently working as an **Associate Professor** in the Department of Electronics & Communication Engineering at **GRIET, Hyderabad** since 4th May 2018.

Award/Grant/Fellowship:

1. Recipient of **Research Excellence Award** from **INSc, Govt. of India** on Sept 2020.

2. Recipient of **Gandhian Young Technological Innovation Award** (GYTI-2018) for my research work "A Low-Cost Disposable Microfluidic Biochip for malaria diagnosis" from the **honourable president of India Shri Ram Nath Kovind Ji** at Rhastrapati Bhavan on 19th March 2018.

3. **Japanese Society for the Promotion of Science (JSPS) award** as an invited speaker for 5th International IEEE Workshop on Low Temperature Bonding for 3D Integration will be held in Tokyo, Japan, on May 16th to 18th, 2017.

4. Recipient of **Excellence in Research award** on two consecutive years during Ph.D. on the foundation day of the institute (Indian Institute of Technology-Hyderabad) for the calendar year of 2015 and 2016.

5. **DST Young Scientist** Grant under International Travel Support (ITS) scheme to attend 66th IEEE Electronics Component & Technology Conference (ECTC) 2016 at **Las Vegas, Nevada, USA** from 31st May - 03 June, 2016 (Ref No. ITS/470/2016-17).

6. **CSIR Young Scientist** foreign travel Grant to attend 6th IEEE Electronics System-Integration Technology Conference, **Grenoble, France** during 13 Sep 2016 to 16 Sep 2016 (Ref No. TG/8931/16-HRD).

7. **MHRD International travel fund** to attend 65th IEEE Electronics Component & Technology Conference (ECTC) 2016 at **San Diego, California, USA** from 26th -29th May, 2015.

8. **SPTS Go Pro Hero Award** for best Interactive presentation during 65th IEEE Electronics Component & Technology Conference (ECTC) 2015 at **San Diego, California, USA** from 26th -29th May, 2015.

9. **Institute Fellowship** to attend 18th IWPSD 2015 at IISc, Bangalore from 7th – 10th Dec, 2015.

10. Awarded **9 pointer** multiple times during Bachelor of Technology at NIST, Bam, Odisha.

Certification Courses:

1. TEQIP online certification for successful completion of course on "**Digital Transformation on Teaching Learning Process**" from 6th to 22nd April 2020 by Indian Institute of Technology Bombay.

2. Certificate for completion of "**LaTex training"** by IIT Bombay funded by National Mission on Education through ICT, MHRD, Govt., of India on 6th May 2020.

3. CEQIP Course on "**Semiconductor Technology & Manufacturing**" from 10th to 15th December, 2013

at IIT Bombay.

4. Undertake a **21 days** training program on the course entitled **"Electronic Design Automation Software Tools for VLSI/ASIC design"** at NIST, Berhampur.

Conference/Seminar/Workshop Attended:

1. Presented a paper entitled "Implementation of Smart Energy Meter through Prepaid Transaction using IOT" at 6th IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (**RTEICT -2021**) organized by Sri Venkateshwara College of Engineering, Bengaluru, India from 27th and 28th Aug 2021.

2. Presented a paper entitled "Analysis of Nanowire FET over FinFET" at 4th International Conference on Advancements in Aeromechanical Materials for Manufacturing (**ICAAMM-2021**) organized by MLRIT, Hyderabad, India from 27th and 28th Aug 2021.

3. Presented a paper entitled "An extensive survey on Assessment of Multicore Processors for Embedded Systems" at International Conference on Advances in Signal Processing and Communication Engineering (**ICASCE-2021**) organized by MGIT, Hyderabad, India from 29th to 31st July 2021.

4. Presented a paper entitled "Reduction of Electrical Signal Interference for future IC Integration-An Extensive Review" at IEEE International Conference on Intelligent Technologies (**CONIT-2021**) at K. L. E. Institute of Technology, Hubballi, Karnataka, India from 25th to 27th June 2021.

5. Presented a paper entitled "Hardware Based Voice Authenticated Security System" at IEEE International Conference on Intelligent Technologies (**CONIT-2021**) at K. L. E. Institute of Technology, Hubballi, Karnataka, India from 25th to 27th June 2021.

6. Presented a paper entitled "Road extraction using Aerial images for future Navigation" at International Conference on "Technology Innovation in Mechanical Engineering" (**TIME-2021**) Organised by Department of Mechanical Engineering, SISTec-Gandhinagar, Bhopal from 10th and 11th May 2021.

7. Attended and presented a paper entitled "A Novel Approach for detection of the symptomatic patterns in the acoustic biological signal using Truncation Multiplier" at 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (**ICICICT**-2019), Vimal Jyothi Engineering College, Jyothi Nagar, Kannur Dist., Kerala, India, July 2019.

8. Attended and Presented an **invited paper** entitled "Optimized ultra-thin Manganin alloy Passivated fine-pitch damascene compatible Cu-Cu bonding at sub 200°C for 3D IC Integration" at 5th IEEE International Workshop on Low temperature bonding for 3D Integration, **University of Tokyo, Japan**, 2017

9. Attended **Bio Asia 2017 conference** from 6th to 8th Feb 2017 at Novotel International Convention Centre, Hyderabad.

10. Attended and presented poster entitled "High quality fine-pitch Cu-Cu Wafer-on-Wafer bonding with optimized Ti passivation at 160˚C" in 66th **IEEE Electronics Component & Technology Conference 2016,** 31st May - 03 June, 2016, at Las Vegas, Nevada, USA.

11. Attended and presented paper entitled "Optimized ultra-thin Ti Passivation for achieving high quality fine pitch bump less Cu-Cu Wafer-on-Wafer bonding at 175˚ C" in 1**8th International Workshop on Physics of Semiconductor Devices** (**18th IWPSD),** 7th to 10th December 2015, at IISc, Bangalore, India.

12. Attended and presented poster entitled "Low Temperature, Low Pressure CMOS Compatible Cu-Cu Thermo-compression Bonding with Ti Passivation For 3D IC Integration" in 65th **IEEE Electronics Component & Technology Conference 2015,** 26th to 29th May 2015, at San Diego, California, USA.

13. Attended **INUP Hands-on Training Workshop** and participated in the Hands-on Training on MEMS Cantilever Fabrication and Micro and Nano Characterization Techniques during 3rd to 12th Feb, 2015 at IISc, Bangalore.

14. Attended **2nd INUP Familiarization Workshop** on Nanofabrication Technologies during 28th to 30th Nov, 2014 at IIT, Bombay.

15. **IEEE-EDS** Mini-colloquium on "**Nanoelectronics**" on 30 Nov 2010 at NIST, Berhampur. (Speaker: Hiroshi Iwai, Japan).

FDP's/ Workshops/Conferences conducted

1. Conducted an one week Faculty Development Program on " Recent Trends in VLSI" by Dept. of ECE, Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad-500090, Telangana, India during 02nd to 07th June 2020 as **Program coordinator.**

2. Conducted Three-Day Workshop on Future IC Integration techniques and simulations with FEM Simulator by Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad-500090, Telangana, India during 25th to 27th Feb 2019 as **Convener.**

3. Co-ordinated Two-day workshop on Design of Robotic Arm using MATLAB-Solidworks by Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad-500090, Telangana, India during 11th -12th March 2019 as **Program coordinator.**

4. Conducted Faculty Development Program on Recent Trends in VLSI by Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad-500090, Telangana, India during 02nd June to 07th June 2020 as **Program coordinator.**

5. Co-ordinated 1st International Conference on Advances in Communications, Computing and Embedded Systems (ACCES-2020) by Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad-500090, Telangana, India during 18th -19th September 2020 **as Reviewer Committee member.**

6. Co-ordinated AICTE sponsored Short Term Training Program (STTP) on Automotive Technology for a sustainable Future by Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad-500090, Telangana, India during 5th to 10th Oct 2020 as **Co-Coordinator.**

Technical Skills

The interdisciplinary nature of my research topic allowed me to learn a wide variety of tools and analysis techniques. A few of them are listed below by category:

- **Semiconductor Processing**: Developed a process flow/technology for low temperature, low pressure fine pitch Cu-Cu bonding. This provided me with the opportunity to become learn the following semiconductor processing techniques:
    - Wet chemistry, Dry and wet oxidation, DC/RF Sputtering, Thermal evaporation, Optical Lithography, Mask Writing (Laser Writer),Wafer bonding, XeF_2 dry etching system
- **Material Characterizations**: XRD, FE-SEM, AFM, TEM and EDX.
- **Electrical Characterizations**: DC Probe station, Cryogenic Probe station, High temperature Probe station
- **Design Tools**: 1. COMSOL Multiphysics to simulate and verify performance of noise/ electrical coupling between signal carrying Through Silicon Vias (aggressive TSV's) and ground TSV's (victim TSV's),

  2. CLEWIN for layout design of masks.

  3. Synopsis TCAD : For device simulation.

Professional Training

1. Cross-sectional Transmission Electron Microscopy sample Preparation: **Gatan Inc., USA**.

2. Laser Writer (LW405B): **Microtech, Italy**, September-2014.

Teaching Assistantship

Worked as a Teaching Assistant (TA) for the courses (Theory: VLSI Technology, More than Moore and Lab: Semiconductor Device and Modelling Lab, VLSI Technology Lab), at IIT Hyderabad.

Professional Society

1. InSc Life Member.
2. Editorial Board Member of ARSEAM Journal "**International Journal of Advances in Engineering & Scientific Research**".
3. Reviewer of **IEEE Access** – IEEE Publisher.
4. Reviewer of **Silicon** – Springer Nature Publisher.
5. Reviewer of **Materials today: Proceedings**- Elsevier Publisher.
6. Reviewer of **Microelectronics Engineering** – Elsevier Publisher.
7. Reviewer of **ACS Applied Materials & Interface**- ACS Publisher.
8. Reviewer of **ECS Solid State Technology**- Electrochemical Society, Inc.

Personal Details

Father's Name: Dr. Bipin Bihari Panigrahi
Mother's Name: Mrs. Subasini Panda
Date of Birth: 21st March, 1986
Nationality: Indian
Marital Status: Married

Reference:

1. **Dr. Shiv Govind Singh**

   Professor, Department of Electrical Engineering,
   Indian Institute of Technology Hyderabad, Kandi-502285, Telangana
   Mob: +91-99596-03640
   Email: sgsingh@iith.ac.in
2. **Dr. Ajit Kumar Panda,** PDF (USA)

   Professor, IEEE EDS Distinguished Lecturer
   National Institute of Science and Technology
   Palur Hills, Berhampur, Odisha, India - 761008
   Mob: +91-94370-14147
   Email: akpanda62@hotmail.com (or) akpanda@ieee.org

Publications and Patents (After award of Ph.D):

Patent

1. **Asisa Kumar Panigrahy** *et.al.* "Encryption based Security Solution for Data Communication of IOT Devices", Indian Patent Issue No. **36/2020**, Published on 04th September 2020.

2. **Asisa Kumar Panigrahy** *et.al.* "Artificial Intelligence based smart Detection of Lung Disease from Chest X-RAY", **Australian Patent** no. 2020104159, **granted on** 31st March 2021.

International Journals:

1. M. Durga Prakash, Shaik Lathifa Nihal, Shaik Ahmadsaidulu, Raghunandan Swain, **Asisa Kumar Panigrahy** "Design and Modelling of Highly Sensitive Glucose Biosensor for Lab-on-chip Applications" Silicon (2022). https://doi.org/10.1007/s12633-021-01543-0
2. M. Durga Prakash, Beulah Grace Nelam, Shaik Ahmadsaidulu, Alluri Navaneetha, and **Asisa Kumar Panigrahy**. "Performance Analysis of Ion-Sensitive Field Effect Transistor with Various Oxide Materials for Biomedical Applications." Silicon (2021): 1-11. https://doi.org/10.1007/s12633-021-01413-9

3. M. Durga Prakash, B. Vamsi Krsihna, B V V Satyanarayana, N. Arun Vignesh, **Asisa Kumar Panigrahy**, Shaik Ahmadsaidulu, "A Study of an Ultrasensitive Label Free Silicon Nanowire FET Biosensor for Cardiac Troponin I Detection." Silicon (2021): 1-8. https://doi.org/10.1007/s12633-021-01352-5

4. Siva Sankara Phani T, Mamatha Samson, P Rahul Reddy, A Kishore Reddy, **Asisa Kumar Panigrahy**, and M. Durga Prakash, "An energy-efficient reconfigurable accelerators in multi-core systems using PULP-NN." *Applied Nanoscience* (2021): 1-14. https://doi.org/10.1007/s13204-021-02069-y

5. A. Lakshmi Narayana, B. Prasad, Prabhakara Rao Kapula, Dumpa Prasad, **Asisa Kumar Panigrahy**, and D. N. V. S. L. S. Indira. "Enhancement in performance of DHTprecoding over WHT for EC companded OFDM in wireless networks." Applied Nanoscience (2021): 1-16. https://doi.org/10.1007/s13204-021-02016-x

6. Caleb Meriga, Ravi Teja Ponnuri, B. V. V. Satyanarayana, A. Gudivada, **Asisa Kumar Panigrahy**, and M. Durga Prakash. "A Novel Teeth Junction Less Gate All Around FET for Improving Electrical Characteristics." ***Silicon*** (2021): 1-6. https://doi.org/10.1007/s12633-021-00983-y

7. **Asisa Kumar Panigrahy**, Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh. "Surface Density Gradient Engineering Precedes Enhanced Diffusion; Drives CMOS In-Line Process Flow Compatible Cu–Cu Thermocompression Bonding at 75° C." ***IEEE Transactions on Device and Materials Reliability*** 19, no. 4 (2019): 791-795.

8. Satish Bonam, **Asisa Kumar Panigrahi,** C.Hemanth Kumar, Siva Rama Krishna Vanjari, Shiv Govind Singh, "Post-CMOS Compatible Engineered Ultra-thin Au passivated Cu-Cu

thermocompression bonding for 3D IC and Heterogeneous Integration Applications," ***IEEE Transactions on Components, Packaging and Manufacturing Technology*** 9, no.7, pp. 1227-1234, 2019**.**

9. **Asisa Kumar Panigrahi,** Tamal Ghosh, C.Hemanth Kumar, Shiv Govind Singh, and Siva Rama Krishna Vanjari, "Direct, CMOS In-line Process flow compatible, Sub 100˚C Cu-Cu thermocompression bonding using Stress Engineering", ***Electronic Materials Letters*** 14, no. 3, pp. 328-335, 2018.

10. **Asisa Kumar Panigrahi,** Kuan-Neng Chen. "Low Temperature Cu-Cu Bonding Technology in 3D Integration: An Extensive Review*", **Journal of Electronic Packaging 140,*** no. 1, 010801, 2018.

11. **Asisa Kumar Panigrahi**, C. Hemanth Kumar, Satish Bonam, Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Optimized ultra-thin manganin alloy passivated fine-pitch damascene compatible bump-less Cu–Cu bonding at sub 200 °C for three-dimensional Integration applications," ***Japanese Journal of Applied Physics 57***, 02BC04, 2018.

International Conferences

1. Nandan Goud Ambati, Jashwanth Chandhra Adama, Anudeep Chakiri, Gohith Sai Vure, Saikumar Dharavath, Durga Naga Snehit Kaliki, Naveen Eggadi, Nikhil Chandra Balne, and **Asisa Kumar Panigrahy**, "Hardware Based Voice Authenticated Security System." In 2021 IEEE International Conference on Intelligent Technologies (CONIT), pp. 1-5. IEEE, 2021.
2. P. Rahul Reddy, A. Kishore Reddy, Dumpa Prasad, Koya Jeevan Reddy, and **Asisa Kumar Panigrahy**, "Reduction of Electrical Signal Interference for future IC Integration-An Extensive Review." In 2021 IEEE International Conference on Intelligent Technologies (CONIT), pp. 1-4. IEEE, 2021.

3. Dumpa Prasad, P. Rahul Reddy, B. Sreelatha, Koya Jeevan Reddy, Sudharsan Jayabalan, and **Asisa Kumar Panigrahy**. "Recent developments in code compression techniques for embedded systems." Materials Today: Proceedings (2021).

4. A. Sravanthi Peddinti, Arjun Singh Chouhan, and **Asisa Kumar Panigrahy**. "Road extraction using Aerial images for future Navigation." Materials Today: Proceedings (2021).

5. Moupuri Satish Kumar Reddy, **Asisa Kumar Panigrahy**, and K. Selvajyothi. "Minimization of Electric Vehicle charging Stations influence on Unbalanced radial distribution system with Optimal Reconfiguration using Particle Swarm Optimization." In 2021 International Conference on Sustainable Energy and Future Electric Transportation (SEFET), pp. 1-6. IEEE, 2021.

6. Rama Vasantha Adiraju, Kranthi Kumar Masanipalli, Tamalampudi Deepak Reddy, Rohini Pedapalli, Sindhu Chundru, and **Asisa Kumar Panigrahy**. "An extensive survey on finger and palm vein recognition system." Materials Today: Proceedings 45 (2021): 1804-1808.

7. Venkata Kiran Sanipini, Banothu Rakesh, Aruna Jyothi Chamanthula, N. Santoshi, A. Arunkumar Gudivada, and **Asisa Kumar Panigrahy**. "Thermal management in TSV based 3D IC Integration: A survey." Materials Today: Proceedings 45 (2021): 1742-1746.

8. Alluri Navaneetha, A. Kishore Reddy, S. Aruna Deepthi, Ch Usha Kumari, Praveen Kumar Poola, A. Arunkumar Gudivada, Matta Durga Prakash, and **Asisa Kumar Panigrahy**. "Performance evaluation of noise coupling on Germanium based TSV filled material for future IC integration technique." Materials Today: Proceedings 45 (2021): 1494-1497.

9. A. Arunkumar Gudivada, K. Jayaram Kumar, Srinivasa Rao Jajula, Durga Prasad Siddani, Praveen Kumar Poola, Varun Vourganti, and **Asisa Kumar Panigrahy**. "Design of area-efficient high speed 4× 4 Wallace tree multiplier using quantum-dot cellular automata." Materials Today: Proceedings 45 (2021): 1514-1523.

10. Dadaipally Pragathi, Dumpa Prasad, Tatiparti Padma, P. Rahul Reddy, Ch Usha Kumari, Praveen Kumar Poola, and **Asisa Kumar Panigrahy**. "An extensive survey on reduction of noise coupling in TSV based 3D IC integration." Materials Today: Proceedings 45 (2021): 1471-1480.

11. Banothu Rakesh, Dumpa Prasad, Ch Usha Kumari, N. Arun Vighnesh, M. Suresh, and **Asisa Kumar Panigrahy**. "Simplistic approach to reduce thermal issues in 3D IC integration technology." Materials Today: Proceedings 45 (2021): 1399-1402.

12. Ch Usha Kumari, A. Sampath Dakshina Murthy, B. Lakshmi Prasanna, M. Pala Prasad Reddy, and **Asisa Kumar Panigrahy**. "An automated detection of heart arrhythmias using machine learning technique: SVM." Materials Today: Proceedings 45 (2021): 1393-1398.

13. M. Meghana, Ch Usha Kumari, J. Sthuthi Priya, P. Mrinal, K. Abhinav Venkat Sai, S. Prashanth Reddy, K. Vikranth, T. Santosh Kumar, and **Asisa Kumar Panigrahy**. "Hand gesture recognition and voice controlled robot." Materials Today: Proceedings 33 (2020): 4121-4123.

14. Dadaipally Pragathi, Ch Usha Kumari, M. Usha Rani, T. Santosh Kumar, Tatiparti Padma, P. Sriram Kumar, and **Asisa Kumar Panigrahy**. "Simplistic approach to alleviate noise coupling issues in 3D IC integration." Materials Today: Proceedings 33 (2020): 4007-4011.

15. Banothu Rakesh, Kailaas Mahindra, Marri Sai Venkat Goud, N. Arun Vignesh, Tatiparti Padma, and Asisa Kumar Panigrahy. "Facile approach to mitigate thermal issues in 3D IC integration using effective FIN orientation." Materials Today: Proceedings 33 (2020): 3085-3088.

16. Dadaipally Pragathi, Banothu Rakesh, P. Sriram Kumar, N. Arun Vignesh, Tatiparti Padma, and **Asisa Kumar Panigrahy**. "Noise performance improvement in 3D IC integration utilizing different dielectric materials." Materials Today: Proceedings 33 (2020): 3117-3123.

17. S. Sairam Akhil, N. Arun Vignesh, Sudharsan Jayabalan, E. Karthikeyan, Ayyem Pillai, Ch Usha Kumari, and **Asisa Kumar Panigrahy**, "A Novel Approach for detection of the symptomatic patterns in the acoustic biological signal using Truncation Multiplier." In *2019 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT)*, vol. 1, pp. 49-53. IEEE, 2019.

18. Ch Usha Kumari, Padmavathi Kora, K. Meenakshi, K. Swaraja, T. Padma, **Asisa Kumar Panigrahy**, and N. Arun Vignesh. "Feature Extraction and Detection of Obstructive Sleep

Apnea from Raw EEG Signal." In *International Conference on Innovative Computing and Communications*, pp. 425-433. Springer, Singapore, 2020.

19. S. Kanithan, N. Arun Vignesh, Asisa Kumar Panigrahy, V. Ayyem Pillai, E. Karthikeyan, CH Usha Kumari, Sudharsan Jayabalan, and T. Santosh Kumar. "A Survey on Energy Efficient Image Transmission in WSN." In *2019 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT)*, vol. 1, pp. 41-44. IEEE, 2019.

20. **Asisa Kumar Panigrahi**, C.Hemanth Kumar, Satish Bonam, Tamal Ghosh, Nirupam Paul, Siva Rama Krishna Vanjari and Shiv Govind Singh "Metal-alloy Cu surface passivation leads to high quality fine -pitch bump-less Cu-Cu bonding for 3D IC and Heterogeneous integration applications," In IEEE 68th Electronic Components and Technology Conference (ECTC), pp. 1561-1566, IEEE, 2018.

21. C.Hemanth Kumar, **Asisa Kumar Panigrahi**, Satish Bonam, Tamal Ghosh, Nirupam Paul, Siva Rama Krishna Vanjari and Shiv Govind Singh, "Achieving of intensified conductive interconnections for Flex-on-Flex by using metal passivated Copper – Copper Thermocompression bonding," In IEEE 68th Electronic Components and Technology Conference (ECTC) pp. 1732-1737, IEEE, 2018.

22. **Asisa Kumar Panigrahi**, Satish Bonam, Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Diffusion enhanced drive sub 100 ˚C wafer level fine-pitch Cu-Cu thermocompression bonding for 3D IC integration," In 2019 IEEE 69th Electronic Components and Technology Conference (ECTC), pp. 2156-2161. IEEE, 2019.

Book Chapters:

1. Usha Kumari C., **Panigrahy A.K**., Arun Vignesh N. (2020) Sleep Bruxism Disorder Detection and Feature Extraction Using Discrete Wavelet Transform. In: Singh P., Panigrahi B., Suryadevara N., Sharma S., Singh A. (eds) Proceedings of ICETIT 2019. *Lecture Notes in Electrical Engineering, vol 605. Springer, Cham*

Publications and Patents (Before award of Ph.D):

Patent:

1. **Asisa Kumar Panigrahi**, Satish Bonam, Siva Rama Krishna Vanjari, and Shiv Govind Singh "Optimized ultra-thin alloys leads sub 140 degree Celsius and Low Pressure 2.5 bar Cu-Cu bonding for 3D ICs", Indian Patent Issue No. **16/2018**, Published on 20th April 2018.

International Journals:

1. **Asisa Kumar Panigrahi,** Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Oxidation resistive, CMOS compatible Copper based Alloy ultrathin films as a superior passivation mechanism for achieving 150˚C Cu-Cu wafer on wafer thermocompression bonding, " ***IEEE Transactions on Electron Devices,*** 64(3), pp.1239-1245, 2017.

2. **Asisa Kumar Panigrahi,** Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Demonstration of Sub 150 ˚C Cu-Cu thermocompression bonding for 3D IC applications, utilizing an ultra-thin layer of Manganin alloy as an effective surface passivation layer", ***Materials Letters*** 194, pp.86-89, 2017.

3. **Asisa Kumar Panigrahi**, Brince Paul K, Vikrant Singh, and Shiv Govind Singh, "Multi-walled carbon nanotube- zinc oxide nanofiber based flexible chemiresitive biosensor for malaria biomarker detection", ***Analyst 142,*** *pp.* 2128-2135**,** 2017.

4. Brince Paul K, **Asisa Kumar Panigrahi**, Vikrant Singh, and Shiv Govind Singh, "Nonlithographic fabrication of Plastic-based nanofibers Integrated Microfluidic Biochip for sensitive infectious biomarker detection", ***ACS applied materials & interfaces***, 9(46), 39994-40005, 2017.

5. **Asisa Kumar Panigrahi**, Satish Bonam, Tamal Ghosh, Shiv Govind Singh, and Siva Rama Krishna Vanjari, "Ultra-thin Ti passivation mediated breakthrough in high quality Cu-Cu bonding at low temperature and pressure," ***Materials Letters*** **169,** *pp.* 269-272, 2016.

6. Tamal Ghosh, K. Krushnamurthy, **Asisa Kumar Panigrahi**, Asudeb Dutta, Ch Subrahmanyam, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Facile non thermal plasma based desorption of self assembled monolayers for achieving low temperature and low pressure Cu–Cu thermo-compression bonding," ***RSC Advances*** **5**, no. 125, pp.103643-103648, 2015.

7. Nirupam Paul, Sudharshan Vadnala, **Asisa Kumar Panigrahi**, Hemanth Kumar, Amit Agrawal, and Shiv Govind Singh, "Vanadium Pentoxide Nanofibers as IR sensors for Bolometer Application", ***ECS Transactions***, 85(13), pp.1573-1583, 2018.

International Conferences:

1. **Asisa Kumar Panigrahi**, Satish Bonam, Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Low temperature, low pressure CMOS compatible Cu-Cu thermo-compression bonding with Ti passivation for 3D IC integration." In Electronic Components and Technology Conference (ECTC), 2015 IEEE 65th, pp. 2205-2210. IEEE, 2015. ***(IEEE Xplore)***

2. **Asisa Kumar Panigrahi**, Satish Bonam, Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "Long term efficacy of ultra-thin Ti passivation layer for achieving low temperature, low pressure Cu-Cu Wafer-on-Wafer bonding", In 3D Systems Integration Conference (3DIC), 2015 International, pp. TS8-13. IEEE, 2015. ***(IEEE Xplore)***

3. **Asisa Kumar Panigrahi**, Satish Bonam, Tamal Ghosh, Siva Rama Krishna Vanjari, and Shiv Govind Singh, "High quality fine-pitch Cu-Cu Wafer-on-Wafer bonding with optimized Ti passivation at 160˚C", In 66th IEEE Electronic Components and Technology Conference (ECTC), 2016 IEEE, pp. 1791-1796. IEEE, 2016. ***(IEEE Xplore)***

4. **Asisa Kumar Panigrahi,** S. Bonam, T. Ghosh, S. R. Krishna Vanjari and S. Govind Singh, "Low temperature CMOS compatible Cu-Cu thermo-compression bonding with constantan alloy passivation for 3D IC integration," 2016 IEEE International 3D Systems Integration Conference (3DIC), San Francisco, CA, USA, 2016, pp. 1-4. ***(IEEE Xplore)***

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