

## CURRICULUM VITAE

**Dr. UMESH CHANDRA PATI**

**Associate Professor**

**Department of Electronics and Communication Engineering,  
National Institute of Technology Rourkela– 769008, ODISHA, India.**

**Email:** [ucpati@nitrkl.ac.in](mailto:ucpati@nitrkl.ac.in) , [drumeshchandrapati@gmail.com](mailto:drumeshchandrapati@gmail.com)

**Phone:** (+91) 9438622795 (M), (0661) 2462456 (O); **Fax:** (0661) 2462999

**IEEE Member (General & Instrumentation and Measurement Society) (Member Id: 90766191)**

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### Educational Experience:

| <b>Degree Awarded</b>           | <b>Specialization</b> | <b>Institute/University</b>                |
|---------------------------------|-----------------------|--|
| Bachelor of Technology (B.Tech) | Electrical Engg.      | National Institute of Technology, Rourkela |
| Master of Technology (M.Tech)   | Instrumentation Engg. | Indian Institute of Technology, Kharagpur  |
| Doctor of Philosophy (Ph.D)     | Image Processing      | Indian Institute of Technology, Kharagpur  |

### Membership of Professional Bodies:

- Member: IEEE (General & IM Society) (Membership No. **90766191** for 5 years)
- Life Member: ISTE
- Life Member: Instrument Society of India
- Member: IE (India)
- Life Member: Orissa Engineering Congress
- Life Member: MIR Labs (USA)

### Award Achieved:

- Biography included in 32<sup>nd</sup> Edition of MARQUIS Who's Who in the World 2015.

### Current Areas of Research:

- Control and Instrumentation
- System Identification
- Image Mosaicing
- Image Registration

**Ph.D. Thesis Supervision:**

| <b>Name of the Research Scholar</b> | <b>Title of Ph.D Thesis</b>   | <b>Year of Registration</b> | <b>Year of Completion</b> |
|-------------------------------------|---|-----------------------------|---------------------------|
| Ranjan Kumar Senapati               | Low Power VLSI Implementation of Image Compression Algorithms                     | 2009                        | 2013                      |
| Sankata Bhanjan Prusty              | Development of Adaptive Robust Controllers for Controlling Liquid Level in a Tank | 2012                        | Ongoing                   |
| Achala Pandey                       | Development and Implementation of Novel Algorithms for Image Mosaicing            | 2012                        | Ongoing                   |
| Subhransu Padhee                    | System Identification and Model based Controller Design                           | 2013                        | Ongoing                   |
| Bandana Mishra                      | Image Registration of Medical Images  | 2014                        | Ongoing                   |
| Sourav Paul                         | Multimodal Image Registration   | 2014                        | Ongoing                   |

**Master Thesis Supervision:**

| <b>Name of the Student</b> | <b>Title of Master Thesis Guided</b>  | <b>Year of Completion</b> |
|----------------------------|---|---------------------------|
| Sankata Bhanjan Prusty     | Linearization and Analysis of Level as well as Thermal Process using LabVIEW              | 2012                      |
| Jyoti Prasanna Patra       | A Phase Locked Loop based Integer N Frequency Synthesizer                                 | 2012                      |
| Roopal Agrawal             | Internet based Data Logging and Supervisory Control of Boiler Drum Level using LabVIEW    | 2012                      |
| Rashmi Panda               | Removal of Artifacts from Electrocardiogram   | 2012                      |
| Sunita Mohanta             | A LABVIEW based Data Acquisition System for Monitoring and Analysis of Vibration Signal   | 2013                      |
| Raja N. Reddy              | Fetal ECG Extraction using Wiener, SVD and ICA Techniques                                 | 2013                      |
| Abhyarthana Bisoyi         | Implementation of Online Temperature Controller based on LABVIEW                          | 2013                      |
| Abhinav Deo                | Recognition of Licence Plate and Detection of Optical Nerve Pattern using Hough Transform | 2013                      |
| Vimal Singh Bind           | Robust Techniques for Feature based Image Mosaicing using                                 | 2013                      |

|                     |  |      |
|---------------------|--|------|
|                     | Image Fusion   |      |
| Priya Ranjan Muduli | Development and Implementation of Image Fusion Algorithms based on Wavelets                        | 2013 |
| Sandeep Kumar       | Tuning of PID Controller for Higher Order System   | 2014 |
| Nilimamayee Samal   | Data Acquisition and Linearization of Sensors: Greenhouse Case Study                               | 2014 |
| Jyoti Ranjan Pati   | Modelling, Identification and Control of Cart-Pole System  | 2014 |
| Sangeeta Sahu       | Image Registration Techniques for Medical Images   | 2014 |
| P. Govardhan        | Night Time Pedestrian Detection for Advanced Driving Assistance Systems using Near Infrared Images | 2014 |
| Shishir Maheshwari  | Image Blending using Graph Cut Method for Image Mosaicing  | 2014 |

## Significant Performance

### 1. Conference Organized:

- Served as **General Chair**, International Conference on Electronic Systems (**ICES -2011**), Jan. 2011, National Institute of Technology, Rourkela, India.
- Served as **Publicity Chair**, International Conference on Industrial Electronics, Control and Robotics (**ICER 2010**), Dec. 2010, National Institute of Technology, Rourkela, India.
- Served as **Industrial Track Chair**, International Conference on Advanced Computing, Networking and Informatics (**ICACNI 2013**), June 2013, Raipur, India.
- Served as **Industrial Track Chair & Session Chair**, International Conference on Advanced Computing, Networking and Informatics (**ICACNI 2014**), June 2014, Kolkata, India.

### 2. Departmental Activities Performed:

- Developed **Virtual and Intelligent Instrumentation Lab.** in the Department of Electronics and Communication Engineering, National Institute of Technology, Rourkela, India with financial assistance from Department of Science & Technology (DST), Govt. of India and technical collaboration with **National Instruments (NI)**.
- Served as **Prof-in-Charge (PIC)** of Direct Purchase for the department for two consecutive financial years from 2009-2011.
- Served as **Prof-in-Charge (PIC)** of Research Programme (UG) for the department for two consecutive years from 2009-2011.

- Served as **Chairman (PG & R)** for the department for three consecutive years from 2010-2013.
- Served as **Head, Instrumentation Group** of the department for the years 2013.
- Serving as **Member**, Purchase Committee of the department from July 2014 to till date.
- Serving as **Member**, Department Research Committee from July 2014 to till date.
- Assisted the Head of the Department in **NBA Accreditation** work of the department in 2014.

### **3. Contribution as a Reviewer**

- Reviewer, **IET Image Processing**.
- Reviewer, **EURASIP Journal on Advances in Signal Processing**.
- Reviewer, **International Journal of Distributed Sensor Networks**, Hindawi.
- Reviewer, **International Journal of Computational Vision and Robotics**, Inderscience.
- Reviewer, **Advances in Computer Engineering**, Hindawi.
- Guest Editor, **International Journal of Signal and Imaging Systems Engineering**, Vol. 5, No. 4, 2012.
- Guest Editor, **International Journal of Signal and Imaging Systems Engineering**, Vol. 6, No. 1, 2013.
- Guest Editor, **International Journal of Signal and Imaging Systems Engineering**, Vol. 7, No. 1, 2014.
- Editor, **International Journal of Emerging Trends in Electrical and Electronics** (ISSN: 2320-9569).
- Advisory Board Member, **International Journal of Advanced Computer Research** (ISSN: 2249-7277).
- Reviewer, **Virtual Instrumentation using LabVIEW**, Sanjay Gupta and Joseph John, 2<sup>nd</sup> Edition, Tata McGraw Hill, New Delhi.
- Reviewer, **Optical Fiber Communication**, Gerd Keiser, 4<sup>th</sup> Edition, Tata McGraw-Hill Pvt. Limited.
- Reviewer, **Optical Fiber Communication**, Cambridge University Press India.
- Member of National Advisory Committee, **International Conference on Advances in Computing and Communications (ICACC 2011)**, April 2011, National Institute of Technology, Hamirpur, India.
- Member of International Program Committee, **Second International Conference on Digital Information and Communication Technology and its Applications (DICTAP 2012)**, 16-18 May 2012, Bangkok, Thailand.
- Reviewer, **Students' Conference on Engineering and Systems (SCES-2012)**, 16-18 March 2012, MNNIT Allahabad, India.

- Reviewer, **8<sup>th</sup> IEEE International Conference on Information, Communications and Signal Processing (ICICS 2011)**, 13-16 Dec. 2011, Singapore.
- Member of Program Committee, **International Conference on Soft Computing for Problem Solving (SocProS 2011)**, 20-22 Dec. 2011, Roorkee, India.
- Member in International Program Committee, **World Congress on Information and Communication Technologies (WICT 2011)**, 11-14 Dec. 2011, Mumbai, India.
- Reviewer, **2<sup>nd</sup> Students' Conference on Engineering and Systems (SCES-2013)**, 12-14 April 2013, MNNIT Allahabad, India.
- Member of Technical Program Committee, **2<sup>nd</sup> International Conference on Soft Computing for Problem Solving (SocProS 2012)**, 28-30 Dec. 2012, Jaipur, India.
- Member of International Program Committee, **2<sup>nd</sup> World Congress on Information and Communication Technologies (WICT 2012)**, 30 Oct.- 2 Nov. 2012, Trivandrum, India.
- Reviewer, **9<sup>th</sup> International Conference on Information, Communications and Signal Processing (ICICS 2013)**, 10-13 December 2013, Taiwan, Taiwan.
- Member of Technical Programme Committee, **International Conference on Signal Processing and Integrated Networks (SPIN 2014)**, 20-21 February 2014, Noida, India.
- Member of Technical Programme Committee, **International Symposium on Knowledge-Intensive Software Engineering (KISE 2013)**, 22-25 August 2013, Mysore, India.
- Member of Technical Programme Committee, **International Conference on Advances in Electronics, Computers and Communications (ICAEECC 2014)**, 10-11 October 2014, Bangalore, India.
- Member of Technical Programme Committee, **International Conference on Computational Intelligence in Data Mining (ICCIDM 2014)**, 20-21 December 2014, Burla, India.
- Reviewer, **International Conference on Computational Advancement in Communication Circuits and Systems (ICCACCS 2014)**, 30 Oct.- 1 Nov. 2014, Kolkata, India.
- Member of Technical Programme Committee, **9<sup>th</sup> IEEE International Conference on Industrial and Information Systems (ICIIS 2014)**, 15-17 December 2014, Gwalior, India.

#### **4. Invited talks Delivered:**

- Delivered a Keynote talk on “**3D Surface Reconstruction of Real World Objects**” in International Conference on Advance Computing and Communication (**ICACC 2013**), Ranchi, India in 2013.
- Delivered a Invited lecture on “**Image Mosaicing for Panoramic Images**” at **Lakshmi Narain College of Technology**, Bhopal, India in 2013.

#### **5. Conferences Attended:**

- International Conference on Instrumentation (**ICI 2010**), 21-23 Jan. 2010, Pune, India.
- IEEE International Conference on Virtual Environment, Human-Computer Interfaces and Measurement Systems (**VECIMS 2010**), 6-8 Sept. 2010, Taranto, Italy.

- 8<sup>th</sup> IEEE International Conference on Information, Communications and Signal Processing (**ICICS 2011**), 13-16 Dec. 2011, Singapore.

## **6. Workshops Attained**

- **Formulation of Research and Development Initiatives for Scientists and Technologists**, Engineering Staff College of India, Hyderabad, India, 16-19 Sept. 2014.

## **7. Selected List of Publications:**

### **a) Books published**

- [1] **Umesh C. Pati**, “3-D Surface Geometry and Reconstruction: Developing Concepts and Applications”, IGI Global, USA, 2012 (ISBN-13: 978-1466601130).
- [2] **Umesh C. Pati**, Pranab K. Dutta, Alok Barua, “3-D Reconstruction with Feature Level Fusion: using Range and Intensity Images of an Object”, LAP Lambert Academic Publishing, Germany, 2010 (ISBN-13: 978-3838327181).

### **b) Papers published in International journals**

- [1] Ranjan K. Senapati, **Umesh C. Pati**, Kamala K. Mahapatra, “A Reduced Memory, Low Complexity Embedded Image Coding Algorithm Using Hierarchical Listless DTT”, IET image processing, Vol. 8, No. 4, pp. 213-238, 2014 (DOI: 10.1049/iet-ipr.2012.0295).
- [2] Vijay K. Sharma, Kamala K. Mohapatra, **Umesh C. Pati**, “Non-recursive Computation of 8×8 2D DCT for High Accuracy and Low Area”, Journal of Circuits, Systems and Computers (World Scientific), Vol. 23, No. 10, pp. 1450143-1 – 1450143-21, 2014.
- [3] Priya R. Muduli, **Umesh C. Pati**, “Image Fusion based on Bilateral Sharpness Criterion in DT-CWT Domain“, International Journal of Computational Vision and Robotics, Vol. 4, Nos. ½, pp. 161-170, 2014.
- [4] Ranjan K. Senapati, **Umesh C. Pati**, Kamala K. Mahapatra, “Low bit rate image compression using hierarchical listless DTT algorithm”, International journal of image and graphics,” Vol. 13, No. 1, pp. 1350005-1-1350005-23, Apr. 2013 (World Scientific DOI: 10.1142/S0219467813500058).
- [5] Ranjan K. Senapati, **Umesh C. Pati**, Kamala K. Mahapatra, “An Efficient Sparse 8×8 Orthogonal Transform Matrix for Color Image Compression”, International Journal of Signal and Imaging System Engineering , Vol. 6, No.1, pp. 16-23, Jan. 2013.
- [6] Vimal S. Bind, Priya R. Muduli, **Umesh C. Pati**, “A Robust Technique for Feature based Image Mosaicing using Image Fusion”, International Journal of Advanced Computer Research, Vol. 3, No. 1, pp. 263-268, Mar. 2013 (ISSN 2249-7277).

- [7] Ranjan K. Senapati, **Umesh C. Pati**, Kamala K. Mahapatra, “Listless Block-Tree Embedded Set Partitioning Algorithm for Low Bit Rate Embedded Image Compression”, International Journal of Electronics and Communication (Elsevier Science), Vol. 66, No. 12, pp. 985-995, Dec. 2012 (SCI Impact Factor 0.640).
- [8] Vijay K. Shrama, **Umesh C. Pati**, Kamala K. Mahapatra, “A Simple VLSI Architecture for Computation of 2-D DCT, Quantization and Zig-zag ordering for JPEG”, International Journal of Signal and Imaging Systems Engineering (IJSISE), Vol. 5, No. 1, pp. 58-65, 2012 .
- [9] Ranjan K. Senapati, **Umesh C. Pati**, Kamala K. Mahapatra, “A Novel Fast 4x4 DTT based Image Compression Algorithm”, World Scientific Engineering Academy and Society (WSEAS) Transactions on Signal Processing, Vol. 7, No. 1, pp. 34-43, Jan. 2011.

### c) Papers published in National journals

- [1] Nilimamayee Samal, **Umesh C. Pati**, “PC-based Data Acquisition Platform for Green House”, Journal of the Instrument Society of India, Vol. 44, No. 2, pp. 118-121, June. 2014 (ISSN 0970-9983).
- [2] Pragyan P. Kar, Priyam Saikia, **Umesh C. Pati**, “Performance of Different Control Strategies for Boiler Drum Level Control using LabVIEW”, Journal of the Instrument Society of India, Vol. 44, No. 1, pp. 55-58, Mar. 2014
- [3] Anuran Maiti, **Umesh C. Pati**, “Analysis and Control of First and Second-Order Level Process using LabVIEW”, Journal of the Instrument Society of India, Vol. 43, No. 3, pp. 171-174, Sept. 2013 (ISSN 0970-9983).
- [4] Abhyarthana Bisoyi, **Umesh C. Pati**, “Online Written Communication using Internet Protocol based on Virtual Instrumentation”, Journal of the Instrument Society of India, Vol. 43, No. 3, pp. 175-178, Sept. 2013.
- [5] Roopal Agrawal, **Umesh C. Pati**, “Internet Based Data Logging and Supervisory Control of Boiler Drum Level Using LabVIEW”, Journal of the Instrument Society of India, Vol. 42, No. 3, pp. 189-192, Sept. 2012.
- [6] Sankata B. Prusty, **Umesh C. Pati**, “Analysis of Higher-Order Thermal Process using LabVIEW”, Journal of the Instrument Society of India, Vol. 42, No. 2, pp. 112-114, June 2012 .
- [7] Rashmi Panda, **Umesh C. Pati**, “Performance Analysis of LMS based Adaptive Filter Algorithms for ECG Denoising”, Journal of the Instrument Society of India, Vol. 42, No. 2, pp. 142-145, June 2012.
- [8] **Umesh C. Pati**, Dhananjay Kumar, Pranab K. Dutta, “Laser-based Non-contact Dimension Measurement of an Object”, Journal of the Instrument Society of India, Vol. 40, No. 3, pp. 165-167, Sept. 2010.
- [9] **Umesh C. Pati**, “PC based Humidity Monitoring System”, Journal of the Institution of Engineers (India), Vol. 87, pp 30-33, Jan. 2007.

#### **d) Papers published in International Conference proceedings**

- [1] Priya R. Muduli, **Umesh C. Pati**, “A Novel Edge Detection Technique for Multi-Focus Images using Image Fusion”, Intelligent Computing, Networking and Informatics (Springer Conference Series of Advances in Intelligent Systems and Computing), Vol. 243, pp. 359-367, 2014 (ISBN: 978-81-322-1664-3 ).
- [2] Shishir Maheshwari, **Umesh C. Pati**, “Mosaicing of Images using Unsharp Masking Algorithm for Interest Point Detection”, Proc. of 2014 IEEE International Conference on Advanced Communication, Control & Computing Technologies (ICACCCT), Tamil Nadu, India, pp. 1431-1434, May 2014 (ISBN 978-1-4799-3914-5/14).
- [3] P. Govardhan, **Umesh C. Pati**, “NIR Image based Pedestrian Detection in Night Vision with Cascade Classification and Validation”, Proc. of 2014 IEEE International Conference on Advanced Communication, Control & Computing Technologies (ICACCCT), Tamil Nadu, India, pp. 1435-1438, May 2014 (ISBN 978-1-4799-3914-5/14).
- [4] Nilimamayee Samal, **Umesh C. Pati**, “Multi-channel Data Acquisition and Data Logging for Green House Applications”, Proc. of 2014 IEEE Students’ Conference on Electrical, Electronics and Computer Science (SCEECS), Bhopal, India, pp. 1-5, March 2014 (DOI: 10.1109/SCEECS.2014.6804507, ISBN 978-1-4799-2525-4).
- [5] Sankata B. Prusty, **Umesh C. Pati**, Kamala K. Mahapatra, “Implementation of Fuzzy-PID Controller to Liquid Level System using LabVIEW”, Proc. of International Conference on Control, Instrumentation, Energy and Communication (CIEC), Kolkata, India, pp. 1-5, Feb 2014 (ISBN 978-1-4799-2044-0).
- [6] Achala Pandey, **Umesh C. Pati**, “A Novel Technique for Non-Overlapping Image Mosaicing based on Pyramid Method,” Proc. of 2013 Annual IEEE India Conference (INDICON), Mumbai, India, pp. 1-6, Dec 2013 (DOI: 10.1109/INDCON.2013.6726136 ISBN 978-1-4799-2275-8).
- [7] Priya R. Muduli, **Umesh C. Pati**, “A Novel Technique for Wall Crack Detection using Image Fusion”, Proc. of 2013 International Conference on Computer Communication and Informatics (ICCCI), Coimbatore, India, pp. 1-6, Jan. 2013.
- [8] Sankata B. Prusty, **Umesh C. Pati**, “ Linearization of a MIMO Process using LabVIEW”, Proc. of 2012 IEEE Students’ Conference on Electrical, Electronics and Computer Science (SCEECS), Bhopal, India, pp. 1-5, March 2012 .
- [9] Rashmi Panda, **Umesh C. Pati**, “Removal of Artifacts from Electrocardiogram using Digital Filter”, Proc. of 2012 IEEE Students’ Conference on Electrical, Electronics and Computer Science (SCEECS), Bhopal, India, pp. 1-4, March 2012.
- [10] Roopal Agrawal, **Umesh C. Pati**, “ Internet based Boiler Drum Level Control System using LabVIEW”, Proc. of International Conference on Advances in Computer, Electronics and Electrical Engineering, Bombay, India, pp. 370-373, March 2012 (ISBN: 978-981-07-1847-3).