Alva's Institute of Engineering & Technology
Shobhavana Campus, Mijar, Moodbidri, D.K – 574225
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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Ref: AIET/2016-17/IPR/ECE/01 **Date: 29/09/2016**

To

The Principal

Alva's Institute of Engineering and Technology

Mijar Moodbidri 574225

Respected Sir

Sub: **Requisition to conduct a talk on Applications of MEMS and Patent Rights**

With reference to the above subject I request you to permit me to conduct **a talk on "Applications of MEMS and Patent Rights" by Dr. M M Nayak, Visiting professor, Indian Institute of Science, (Former Scientist of ISRO), Bangalore,** in order to inculcate the research and patenting knowledge among the students on **28th October 2016**. Kindly oblige and do the needful.

Thanking you

HOD

Dr. D V Manjunatha

H.O.D.
Dept. Of Electronics & Communication
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

PRINCIPAL
Alva's Institute of Engg. & Technology,
Mijar, MOODBIDRI - 574 225, D.K

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DEPT. OF ELECTRONICS & COMMUNICATION ENGINEERING

Date: 29-09-2016

To,

Dr. M M Nayak
Visiting professor,
Indian Institute of Science, (Former Scientist of ISRO),
Bangalore.

Dear Sir,

Sub: Invitation for a talk on "**Applications of MEMS and Patent Rights**"

I am pleased to have the honour of inviting you for a talk on "Applications of MEMS and Patent Rights" for our institute technical activity. We have arranged your lecture at our institution on **28th October, 2016.**

Kindly accept our request as a guest speaker

Thanking You

With warm regards

Principal

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Circular

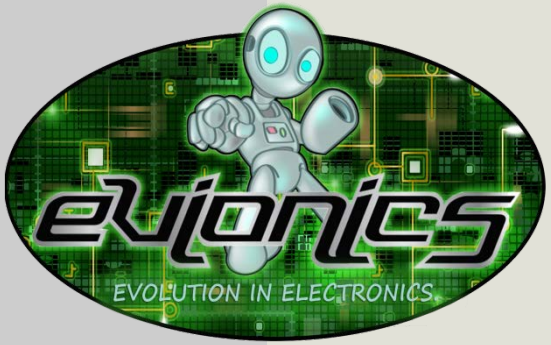
It is hereby informed all the III A & V A & B semester students to that there will be a talk on "Applications of MEMS and Patent Rights" by Dr. M M Nayak Visiting professor, Indian Institute of Science,(Former Scientist of ISRO), Bangalore on **01st October, 2016** in Engineering Seminar hall by 11 AM. So all must present attendance will be monitored.

Mr. Ramesh B & Mr. Aneesh Jain
Technical Coordinator

Dr. D V Manjunatha
H.O.D.
H. O. D.
Dept Of Electronics & Communication
Alva's Institute of ...
Mijar, MOODBIDRI - 574 ...

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

Dept. of Electronics and Communication Engineering



"APPLICATIONS OF MEMS AND PATENT RIGHTS"

To,

PROGRAMME SCHEDULE

- Invocation
- Welcome Speech
- Introduction of Chief Guest
- Technical talk
- Honoring the chief guest
- Vote of thanks

Alva's Institute of Engineering and Technology
Dept. of Electronics and Communication Engineering

We cordially invite you to the

Technical Talk on

"APPLICATIONS OF MEMS AND PATENT RIGHTS"

by

Dr. M M Nayak
Visiting professor,
Indian Institute of Science,
(Former Scientist of ISRO), Bangalore

Venue: Engg. Seminar Hall
Date: 1st October, 2016 by 11 AM

Mr. Ramesh B
Mr. Aneesh Jain
Technical Coordinator

Dr. D V Manjunatha
H.O.D.

Staff & Students
Department of E & C Engineering

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Applications of MEMS and Patent Rights

The Technical Talk of the academic semester for the year 2016-17 under the Department of E&CE was conducted on 28th October, 2016. The Head of the department Prof. D V Manjunatha welcomed the eminent resource person Dr. M M Nayak, Visiting professor, Indian Institute of Science, (Former Scientist of ISRO), Bangalore. Dr M M Nayak delivered the talk on the topic "Applications of MEMS and Patent Rights". The talk was started with defining what is MEMS?. Micro-electromechanical systems (MEMS) is a process technology used to create tiny integrated devices or systems that combine mechanical and electrical components. They are fabricated using integrated circuit (IC) batch processing techniques and can range in size from a few micrometers to millimetres. These devices (or systems) have the ability to sense, control and actuate on the micro scale, and generate effects on the macro scale. The talk was elaborated on the evolution, developments, Innovations and applications in the area of MEMS. He mainly emphasized the importance of different testing methods needed while designing the MEMS sensors for the spacecraft applications. He also highlighted the different project opportunities possible in this field. He encouraged students explore the opportunities in this field and promised of any assistance needed.

Fig: Welcoming Dr. M M Nayak, to the AIET Campus

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Fig: Talk on Applications of MEMS and Patent Rights

He also highlighted the different FEM tools and software available for purpose of simulation and fabrication. Along with this, professor briefed about the Patents opportunities and rights in this emerging area of MEMS. He also insisted students to get the maximum benefits of the upcoming MEMS laboratory in our institution.

Outcome: Students & Faculty gained the knowledge of patent rights in a MEMS and its various technologies which encourages to take up projects and research in the MEMS area.

Coordinator

Head of the Department

H. O. D.
Dept. Of Electronics & Communication
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

Resource Person Profile

Visiting Professor

mmnayak@iisc.ac.in
Phone:
+91 80 2293 3291 Extension: 207

Education:

- Post Doc – JSPS Fellow, 2002-2003, Toyohashi, Japan.
- Post Doc – INSA Fellow, 2000, Delft and Twente, Netherlands.
- Ph. D. Instrumentation, 1994, IISc, Bangalore.
- PG Diploma, 1984, CEDT, IISc, Bangalore.
- BE – EE, 1982, BMSCE, Bangalore.
- DEE, 1970, KPT, Mangalore.

Experience:

- **Visiting Professor**, CeNSE, IISc, Bangalore (August 2011 – Present).
- **Director**, Launch Vehicle Programme Office, ISRO HQ, Bangalore (2010-11).
- **Deputy Director**, Semi-conductor Laboratory, Department of Space, SAS Nagar, Chandigarh (2008-11).
- **Group Director**, Transducer Development and Production Group, LPSC, ISRO, Bangalore (till 2010).
- **Divisional Head**, Advanced Transducers Development Division, LPSC, ISRO, Bangalore.
- **Project Manager**, High Output Transducers for M/s Hughes Space and Communication Co., USA (through ISRO) (1996 – 2000).

Research Interests

- MEMS Packaging
- Pressure Transducers – Conventional and Advanced
- Graphene/RGO/GO based Temperature Sensors
- System Integration, Testing, Calibration etc.

Research Area

MEMS/NEMS MEMS and NEMS Sensors

Patents

Through ISRO:

- Patent No.204437: "0 – 400 psia pressure transducer" (1997, renewed on 6.9.2007).
- Patent No.742/MAS/99: "Ultrasonic Liquid Level Sensor".
- Patent No.IPA0108: "Cryogenic Depletion Sensor".
- Patent under submission: "Polyphase motor based on shape memory alloy".

Conference and Seminars

- "Oxide backing layer for thin film strain gauges", K.Rajanna, M.M.Nayak and S.Mohan, Presented at the IVS National symposium 1988 on Vacuum Science and Technology held during 19 21, December 1988 at IIT, Bombay.
- "Effect of Post deposition heat treatment on the performance of a thin film Pressure transducer", K.Rajanna, M.M.Nayak and S.Mohan, Presented at the 14th National Symposium on Instrumentation NSI 14 held during 3 6, October 1989.
- "Sputtered platinum thin film strain gauges on anodized diaphragm for pressure measurement applications", M.M.Nayak, K.Rajanna, R.Krishnamurthy and S.Mohan, Presented at the IVS (Indian Vacuum Society) Symposium held during October 1993 at NPL, Delhi.
- "Super Invar as strain gauge material", M.M.Nayak, K.Rajanna, S.Mohan N.Gunasekaran and A.E.Muthunayagam, 5th MRSI (Materials Research Society of India) AGM held during February 1994 at DMRL, Hyderabad.
- "Long term stability studies on uncompensated thin film pressure transducers", M.M.Nayak, K.Rajanna, S.Mohan, N.Gunasekaran and A.E.Muthunayagam, Presented at the Instrument Society of India Symposium (NSI 18) held during Jan. 1994 at S.V.University, Tirupathi.
- "Suitability of thin film strain gauge based transducer for bio medical blood pressure monitoring", K.Rajanna, L.Shivalingappa,M.M.Nayak, S.Mohan, S.Anand and S.K.Guha, Presented at the VII National Conference of the Society of Biomaterials and Artificial Organs (India) held during April 8 9, 1994, at Indian Institute of Technology, New Delhi.
- "Pressure sensor with sputtered Ti W thin film strain gauges", M.M.Nayak, N.Gunasekaran, A.E.Muthunayagm, K.Rajanna, S.Mohan, K.Purandher Gota, S.R. Soloman and G.H.Sharma, Presented at NAGANO magel'94, the 1st Magneto- Electronics International Symposium, held during 9- 11, November 1994 at Nagano, Japan.
- "Thin film strain gauge transducer for Bio medical blood pressure Monitoring", K.Rajanna, L.Shivalingappa, S.Mohan,M.M.Nayak, S.Anand and S.K.Guha, Presented at NAGANO magel'94, the 1st Magneto- Electronics International Symposium held during 9 11, November 1994 at Nagano, Japan.
- "Polymer and oxide coatings as insulating layers for thin film strain gauge sensor application – A comparative study", K.Rajanna, M.M.Nayak, S.Mohan and N.Gunasekaran, Presented at the Materials Research Society of India (MRSI) Seventh Annual General Meeting held during 1 3, February 1996 at Indian Institute of Science, Bangalore.
- "Comparative study on conventional strain gauges, thin film strain gauges and polysilicon on insulator (PSOI) based pressure transducers", M.M.Nayak, K.Rajanna, N.Gunasekaran and S.Mohan Presented at the International Conference on Instrumentation (ICI 96) held during August 1996 at Indian Institute of Science, Bangalore.
- "Strain Gauge pattern for the miniaturised temperature compensated integral diaphragm type pressure sensor", K.Rajanna, V.Radhakrishna, and M.M.Nayak, Presented at the National Symposium on Instumenatation (NSI – 24), held at Goa, during February 2- 5, 2000.
- "Study on the applicability of point-contact SAW technique for pressure and strain measurement of flexible substrate", Biren J Parmar, K.Rajanna and M.M.Nayak, presented at the Asia-Pacific conference of Transducers 2006 (APCOT 2006) held at Singapore during June 2006.
- "Thin film based temperature sensor on hard anodized aluminum alloy substrate for cryogenic application", A.Rajendra, A.K.Sharma, H.Bhojraj, D.R.Bhandari, Biren J Parmar, K.Rajanna and M.M.Nayak, presented at the Asia-Pacific conference of Transducers 2006 (APCOT 2006) held at Singapore during June 2006.
- "Study of performance parameters of a silicon pressure sensor", Jaspreet Singh, K.Nagachenchaiah, M.M.Nayak and K. Rajanna, Presented at the Asia-Pacific conference of Transducers 2008 (APCOT 2008) held at Taiwan during June 2008.
- "Flow measurement using MEMS based Piezoresistive Sensor", Jaspreet Singh, M.M.Nayak, K.Nagachenchaiah and K.Rajanna, Proceedings of the 5th Asia-Pacific conference on Transducers and Micro-Nano Technology 2010 (APCOT MNT 2010) held at Perth, Western Australia during July 2010, pp 239.

- "Pressure measurement using MEMS based sensor array over a backward facing step in IISc hypersonic shock tunnel", S.N.Ram, Jaspreet Singh, G.Jagadeesh, M.M.Nayak, Presented at The 28th International Symposium on Shock waves (ISSW 28) held at Manchester, U.K. during July 17 -22, 2011.
- "MEMS based micro actuator for micro jet application", Jaspreet Singh, K.Rajanna, B.Umapathi, M.M.Nayak, K.Nagachenchaiah, Accepted for presention at the IEEE International conference on Sensors 2011 (IEEE SENSORS 2011) to be held in Limerick, Ireland during October 28-31, 2011.
- "Non – Invasive human breath Sensor", Roopa G., M.M.Nayak, K.Rajanna, Accepted for presention at the IEEE International conference on Sensors 2011 (IEEE SENSORS 2011) to be held at Limerick, Ireland during October 28 – 31, 2011.