

# National Institute of Technology, Tiruchirappalli: Performa for CV of Faculty/ Staff Members

---

## Curriculum Vitae



### **Brief Profile:**

I am an Assistant Professor in the Department of Instrumentation Engineering at NIT Trichy, India. My research focuses on exploiting the engineering principles, methods and algorithms for the effective diagnosis and treatment of neurological and neuromuscular disorders.

Prior to my joining the current independent position, I worked as a Postdoctoral Research Fellow in the research group of Prof. Justin Dauwels at the Nanyang Technological University, Singapore. In the Dauwels lab, I primarily focused on developing signal processing and pattern recognition algorithms for the localization of sub-thalamic nucleus of the brain tissue for the effective deep brain stimulation.

Previously, I worked as a postdoctoral researcher at Montreal Neurological Institute and Hospital, McGill University, Canada with Prof. Jean Gotman. In the Gotman's group, I investigated the nonstationary and nonlinear characteristics of intracerebral EEG signals associated with seizure dynamics such as seizure origin, propagation and its termination. Further, I also involved in developing seizure prediction algorithms using nonlinear signal processing methods and pattern recognition techniques.

I received my Ph.D under the supervision of Professor S. Ramakrishnan in July 2016 from the Department of Applied Mechanics at Indian Institute of Technology Madras. My PhD research work consists of design and development of experimental protocol, subject recruitment, signal acquisition and analysis of muscle fatigue condition. During this period, I investigated the nonstationary and cyclostationary variations of surface electromyography signals for the identification of onset and progression of muscle fatigue condition. I have introduced several high resolution time-frequency methods and cyclostationarity measures that are more sensitive to subtle and fast variations of surface EMG signals.

I received my M.Tech from Indian Institute of Technology Madras, India, in 2012. My M.Tech thesis, under the supervision of Professor S. Ramakrishnan, focused on mathematical modelling of synthetic surface electromyography signals under varied neuromuscular conditions.

Previously, I received my B.E in the Department of Electronics and Instrumentation Engineering from Kongu Engineering College under Anna University in 2008.

Please see my CV for more details.

## National Institute of Technology, Tiruchirappalli: Performa for CV of Faculty/ Staff Members

---

1. Name : **Dr. P. A. Karthick**
2. Designation : Assistant Professor
3. Office Address: Department of Instrumentation and Control Engineering, NIT Tiruchirappalli
4. Telephone (Direct) (Optional):  
Telephone : 0431-2503351                      Extn (Optional):  
Mobile (Optional): +91 7538838231
5. Email (Primary): pakarthick@nitt.edu    Email (Secondary) : pakarthick1@gmail.com
6. Field(s) of Specialization: Bio signal and Image Processing, Pattern Recognition Algorithms, Human Machine Interface, Neurological and Neuromuscular Disorders, Muscle Mechanics, Brain Dynamics

### 7. Employment Profile

Job Title	Employer	From	To
Assistant Professor- Instrumentation and Control Engineering Department	NIT Tiruchirappalli	July-2018	Till date
Postdoctoral Research Fellow	NTU Singapore	Jan 2018	June 2018
Postdoctoral Fellow	MNIH, McGill University, Canada	Aug-2016	Dec-2017

### 8. Academic Qualifications (From Highest Degree to High School):

Examination	Board / University	Year	Division/ Grade	Subjects
Ph.D-Biomedical Engineering	IIT Madras	2012-2016	8.31CGPA	Biomedical Engineering
M.Tech-Applied Mechanics	IIT Madras	2010-2012	7.95 CGPA	Biomedical Engineering
B.E	Kongu Engg College- Anna University	1998-2002	First Class	Electronics and Instrumentation Engineering

## National Institute of Technology, Tiruchirappalli: Performa for CV of Faculty/ Staff Members

---

### 9. Awards, Associateships etc.

Year of Award	Name of the Award	Awarding Organization
2014	Neuroinformatics Travel Award	INCF Congress
2014	ITS Travel grant	DST, India

### 10. Fellowships

Year of the Award	Name of the fellowship	Award Organization	From Month/Year	To Month/Year
2017	Savoy Postdoctoral Fellowship	Savoy Epilepsy Foundation	July-2017	Dec-2017
2016	Institute Postdoctoral Fellowship	MHRD, India	March-2016	July-2016
2012	HTRA	MHRD, India	July-2012	Feb -2016
2010	HTTA	MHRD, India	July 2010	Apr-2012

### 11. Publications

1. **Karthick P.A**, Hideaki Tanaka, Hui Ming Khoo, Jean Gotman (2018), Prediction of Secondary Generalized Tonic Clonic Seizures from Intracerebral EEG Signals, *Clinical Neurophysiology*, 129(5), 1030-1040.
2. **P.A.Karthick**, Kai Rui Wan, Nicolas Kon Kam King and Justin Dauwels, (2018) Localization of the sub-thalamic nucleus for DBS stimulation: Study based on wavelet features of microelectrode recordings and machine learning algorithms, *INCF Neuroinformatics*, August 8-10, Montreal, Canada
3. **Karthick P.A**, Hideaki Tanaka, Hui Ming Khoo, Jean Gotman (2017), Prediction of secondary generalization from the seizure onset using intracerebral EEG, Annual meeting of American Epilepsy Society (AES) Conference, Washington, D.C.
4. **P.A. Karthick**, Diptasree Maitra Ghosh and S. Ramakrishnan, Surface electromyography based automatic muscle fatigue detection using time-frequency methods and machine learning algorithms, *Computer Methods and Programs in Biomedicine*, Vol. 154, 2018.
5. **P. A. Karthick** and S. Ramakrishnan (2016), Surface Electromyography Based Muscle Fatigue Progression Analysis Using Modified B Distribution Time-Frequency Features, *Biomedical Signal Processing and Control*, Vol. 26, 42-51.

## National Institute of Technology, Tiruchirappalli: Performa for CV of Faculty/ Staff Members

---

6. **P. A. Karthick**, G. Venugopal and S. Ramakrishnan (2016), Analysis of Muscle Fatigue Progression Using Cyclostationary Property of Surface Electromyography Signals, *Journal of Medical Systems*, Vol. 40(1), 1-11.
7. **P. A. Karthick** and S. Ramakrishnan (2016), Muscle Fatigue Analysis Using Surface EMG Signals and Time-Frequency Based Medium to Low Band Power Ratio, *IET Electronics Letters*, Vol. 52(3).
8. **P.A. Karthick**, G. Venugopal, and S. Ramakrishnan (2015), Analysis of Surface EMG signals under Fatigue and Non-Fatigue Conditions using B-Distribution based Quadratic Time Frequency Distribution, *Journal of Mechanics in Medicine and Biology*, Vol. 15(2): 1540028.
9. **P.A.Karthick**, M.Navaneetha Krishna, N.Punitha, A.R.Jack Fredo and S.Ramakrishnan (2016), Analysis of muscle fatigue conditions using time-frequency images and GLCM features, *Current Directions in Biomedical Engineering*, Vol. 2(1), 483-487.
10. **P. A. Karthick**, G. Venugopal and S. Ramakrishnan (2015), Differentiating Muscle Fatigue And Nonfatigue Conditions Using Surface EMG Signals And Zhao-Atlas-Marks Based Time-Frequency Distribution, *Journal of American Biomedical Sciences Instrumentation*, Vol.51, 115-121.
11. **P. A. Karthick** and S. Ramakrishnan (2014), Estimation of Instantaneous Median Frequency in Surface Electromyography Signals using Quadratic Time Frequency Distribution, *Journal of American Biomedical Sciences Instrumentation*, Vol.50, 191-196.
12. **P. A. Karthick**, Navaneethakrishna M, Ramakrishnan S (2014), Analysis of Progression of Fatigue Conditions in Biceps Brachii Muscles Using Surface Electromyography Signals and Complexity Based Features, 36<sup>th</sup> Annual International IEEE EMBS Conference, Chicago.
13. **P. A. Karthick** and S. Ramakrishnan (2014), Analysis of Fatigue Conditions in Biceps Brachii Muscles Using Surface Electromyography Signals and Strip Spectral Correlation, *IEEE 19<sup>th</sup> International Conference on Digital Signal Processing*, Hong Kong.
14. Navaneethakrishnan, M., **P. A. Karthick** and S.Ramakrishnan (2015), Analysis of Biceps brachii sEMG signal using Multiscale Fuzzy Approximate Entropy conditions, 37<sup>th</sup> Annual International IEEE EMBS Conference, Italy.
15. **P. A. Karthick** and S Ramakrishnan, Analysis of Muscle Fatigue Progression in Biceps Brachii Using Surface Electromyography Signals and Wavelet Packet Entropies, *Frontiers in Neuroinformatics*, DOI:10.3389/conf.fninf.2014.18.00048.

National Institute of Technology, Tiruchirappalli:  
Performa for CV of Faculty/ Staff Members

---

16. **P. A. Karthick** and S. Ramakrishnan (2014), Analysis of Surface Electromyography Signals Using ZAM Based Quadratic Time Frequency Distribution, IEEE 40<sup>th</sup> North East Bio-Engineering Conference, Boston.
17. **P. A. Karthick** and S. Ramakrishnan (2012), A model for the generation of synthetic surface electromyography signals, IMA Conference on Mathematics of Medical Devices and Surgical Procedures, London, UK.
18. Kiran Marri, NavaneethaKrishna. M, Jibin Jose, **P. A. Karthick**, S. Ramakrishnan (2014), Analysis of fatigue conditions in triceps brachii muscle using sEMG signals and Spectral Correlation Density Function, IEEE International Conference on Informatics, Electronics & Vision, Dhaka, Bangladesh
19. **P. A. Karthick** and S. Ramakrishnan (2015), Analysis of Muscle Fatigue Conditions Using Surface EMG Signals and Born-Jordan Distribution, National Symposium on Instrumentation. Journal of Instrumentation Society of India, Accepted.