

## Persistence leads Dr Kumar to research excellence recognition

It was a rewarding moment for Dr Shiu Kumar when accorded with the Fiji National University (FNU) Vice-Chancellor's Award for Research Excellence 2019, in recognition of outstanding achievement in Research in the category of Higher Degree by Research.

The prestigious award is given to an individual researcher whose research activity has achieved considerable impact and recognition outside the University.

Dr Kumar, a lecturer at FNU's College of Engineering, Science and Technology (CEST) in the School of Electrical and Electronics Engineering, completed his PhD this year with three Q1 journal publications, three Q2 journal publications, and five papers in conference proceedings.

To this date, he has published over 20 international journal and conference papers, six of which were published in highly ranked journals and has a citation H-Index of 10 and i10-Index of 10. Dr Kumar's contribution to knowledge is in the discipline of Electrical and Electronics Engineering, Artificial Intelligence, Machine Learning and Pattern Recognition.

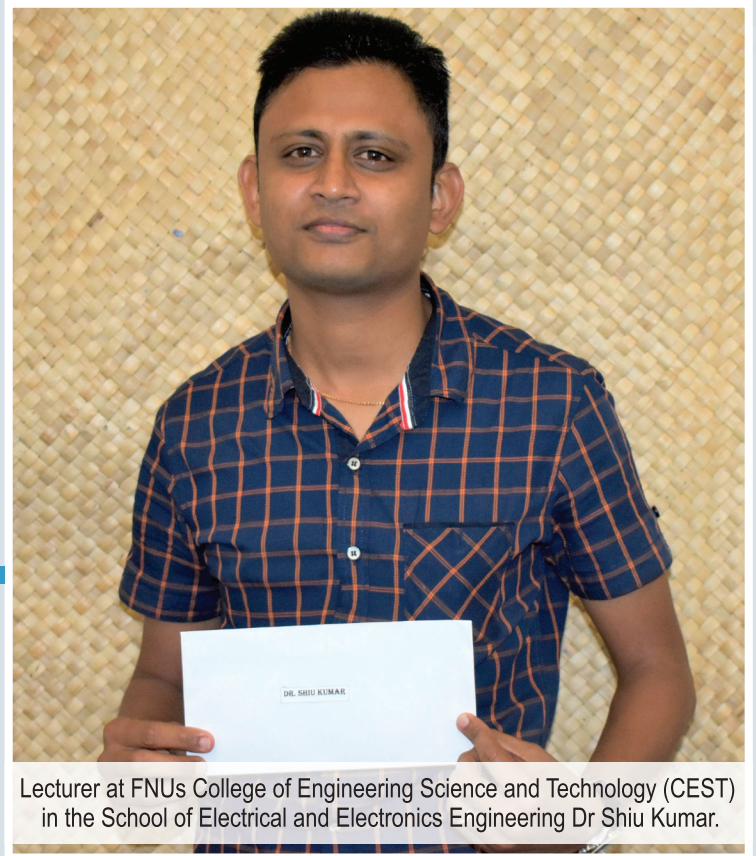
Dr Kumar's PhD research is based on electroencephalography (EEG) Signal Classification and its Application to Brain-Computer Interface Systems using Computational Intelligence Techniques. He has applied feature engineering and pattern recognition to biomedical signals and has developed several state-of-the-art computational models for the prediction of motor imagery (MI) signals.

In his thesis, existing state-of-the-art methods, feature extraction and selection methods, and classifiers for MI EEG signal classification are summarised. Several innovative methods for the classification of different categories of MI EEG signals for BCI applications are also presented.

Ways to improve the Signal to Noise Ratio (SNR), obtain MI EEG signal containing most discriminating information about the different categories of MI tasks, and extract features that are more significant are some of the problems that have been addressed in his research work. Widely used publicly available datasets were used to test, evaluate and compare the proposed methods with existing state-of-the-art methods.

"A significant improvement in classifying MI EEG signals using the proposed methods shows the significance of the research work," Dr Kumar added.

The academic said he is honoured and overwhelmed to have received this recognition by the University.



Lecturer at FNU's College of Engineering Science and Technology (CEST) in the School of Electrical and Electronics Engineering Dr Shiu Kumar.

"I would like to acknowledge FNU, especially the Office of the Pro-Vice-Chancellor Research for such an initiative, which not only recognises our work but also encourages us researchers to work even harder so that we are able to make more contributions and impact through our findings," said Dr Kumar.

According to Dr Kumar, attaining a PhD qualification was a roller-coaster ride, where at times he felt like giving up on this dream.

"A PhD journey is a long one, where there is a high possibility of getting unmotivated at certain times, especially with the rejection of journal papers in the early stages of the study. I had to go through this phase as well."

"However, I stayed focused on my goal and used the positive feedback from my supervisor and the reviewers to improve on my work and get in par with the quality of work expected from me."

Dr Kumar had to burn candles from both ends to successfully complete his education. He did his PhD research on a part-time basis while teaching full-time at FNU.

"This was my biggest hurdle as it became difficult to cope with my studies while managing a full-time workload. Together with this, managing family time was also important."

"Therefore, I had to plan my time in such a way where I was able to manage my workload, carry out research for my study and be able to spend time with family as well."

The academic acknowledged the support from his family and supervisor Professor Alok Sharma in achieving his dream of obtaining a PhD qualification.

"My wife constantly motivated me to finish this successfully. Moreover, I consider having a good supervisor as a blessing. Professor Alok Sharma kept pushing me to get the best out of my work and guided me wherever possible, for which I will forever be grateful."

Dr Kumar commenced his PhD studies in 2014 at The University of the South Pacific and graduated this year.