COMPSIG NITT

In This Issue...

Dear friends! COMPSIG NITT is a monthly newsletter to share the research work done in the Pattern recognition and computational intelligence laboratory, Department of Electronics and Communication Engineering, National Institute of Technology Trichy.

Concepts, Ideas pertaining to Computational intelligence, Pattern recognition and Signal processing are also included in this newsletter.

We expect the feedback, comments and articles from you all.

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VISIT TO SIEMENS CENTER OF EXCELLENCE AT NITT

We, the members of PRCI have visited "Test and Optimization lab", Siemens center of excellence at NITT to explore the facility and to experience the real time data collection as warm up task assigned by the Guide. 1 HP motor with balanced rotating mass (Electrical motor) for bearing coupling machine was demonstrated in Siemens. The frequency domain of the vibration sensor and acoustic sensor (microphone) were collected as the function of the speed of rotating motor. These are usually used to monitor the health of the motor in the real time. The campbell plot (refer Fig.3) is plotted as frequency response of the rotating motor with various rotating speed (rpm). Note that the color indicates the amplitude in frequency domain. (This is similar to Specgram used in speech processing). The frequency response of the vibration sensor, when motor is subjected to various rotational speed (300 to 800 rpm) are plotted in Fig.2. The data was collected from the electrical machine at various frequencies by setting a rotational speed of 300 to 800 rpm. Noise, vibration and harshness parameter can be analyzed from the collected data.It is observed in all the cases (refer Fig.1), the peak frequency is observed around 8000 Hz. The sampling frequency is set to 12050 Hz. By fixing a particular frequency, the amplitude response of the vibration sensor as the function of rpm is plotted (Fig.2). It is observed that at 8000 Hz, the amplitude is increasing as rotation of the motor increases.

Fig.1 illustrates speed(rpm) versus amplitude plot for different frequencies. From the plot, nearly at 8000Hz the amplitude increases as the rpm is increased.

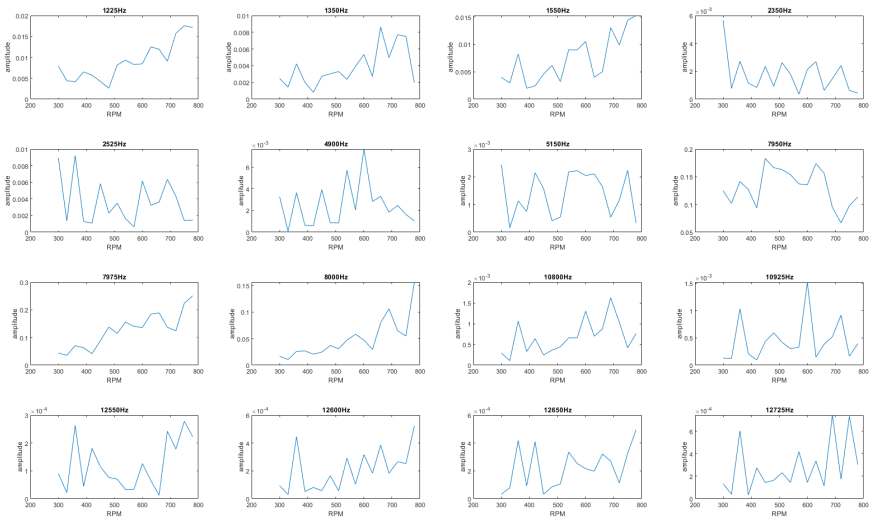

Fig.1: Speed versus amplitude

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Fig.2 illustrates frequency versus amplitude plot for different speed(rpm). From the plot for various frequencies the peek is observed at 8000Hz.

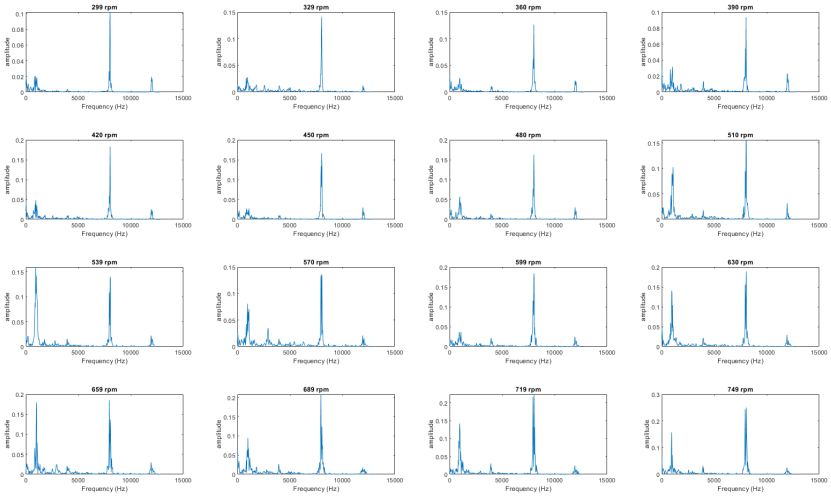

Fig.2:Frequency versus Amplitude

These observations helps in monitoring the health and the performance of the motor. We are planning to develop algorithms based on Machine intelligence, Deep learning and Computational intelligence for health monitoring of engine using similar kind of data.

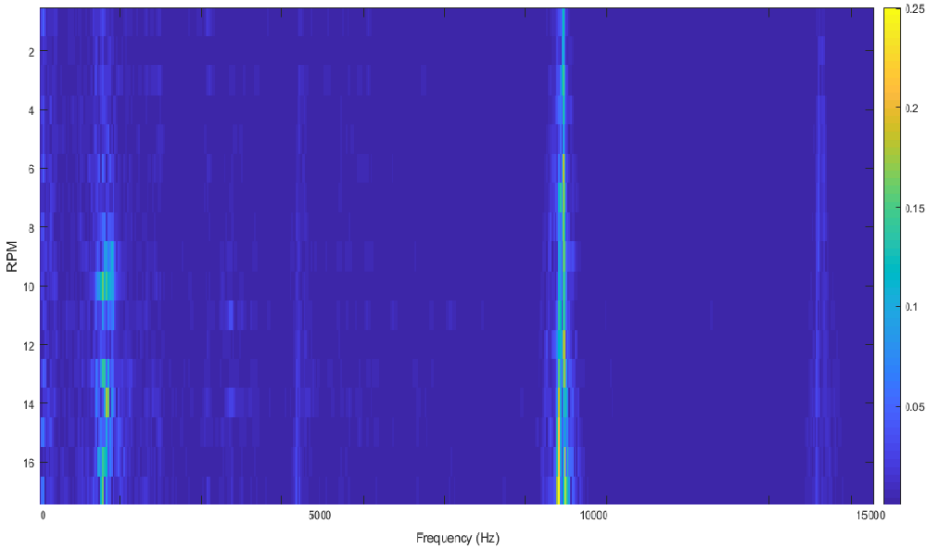

Fig.3:Frequency versus speed

Link to the M File: http://silver.nitt.edu/ esgopi/mfiles/VisitCOE/
For further details contact: K.Vinodha (vinodhakamaraj@gmail.com),Ph.D scholar

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Quotes

> *"Where there is righteousness in the heart, there is beauty in the character. When there is beauty in the character, there is harmony in the home. When there is harmony in the home, there is order in the nation. When there is order in the nation, there is peace in the world." — Dr. A.P.J.Abdul Kalam*

On-going Research

- Investigating Regression techniques for solving the sunflower leaf segmentation problem
- Application of machine learning techniques in next generation wireless communication
- Classification of Music composition styles using probabilistic generative model
- Engine health monitoring using Machine learning,Deep learning and Computational intelligence
- Power allocation & Capacity maximization in NOMA using computational intelligence
- Millimeter wave channel estimation using computational Intelligence

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Feedback

COMPSIG NITT invites articles and innovative ideas from readers for the Reader's Space column. We expect feedback and comments to monthly newsletter COMPSIG NITT . Readers can share their views in our facebook page, COMPSIG-NITT. Those who are interested can be a part of the facebook group.

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