

Report on National Webinar-

"There's more to control systems than we think!"

Name of the Webinar: **There's more to control systems than we think!**

Hosted by: **School of Engineering and Technology, CMR University**

Date and Time: **September 05, 2020 from 4 P.M. to 5:00 P.M**

Total no. of Participants: 51

Speaker: **Janani Venkatasubramanian (Doctoral Student, International Max Planck Research School for Intelligent Systems, Pfaffenwaldring 9, 70569 Stuttgart, Germany.)**

Organized by: **Department of Electronics and Communication Engineering, SoET, CMR University.**

Platform: **Google Meet**

Details of Meeting ID: **Saturday, September 05, 2020 4:00 pm | 1 hour | (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi**

Join by phone +1 804-803-5061 (PIN: 283389716)

Link: <https://meet.google.com/jpc-fqxc-euc>

Introduction

The document on hand is a narration of the details about proceedings of the session on **There's more to control systems than we think!** Program that was hosted by Dept. of Electronics and Communication Engineering, SoET, CMR University. The session was conducted on Google Meet platform and it was organized for faculties and students.

Human beings are capable of learning, reasoning, and carrying out complex tasks to achieve goals. Ever since the agricultural revolution, human beings have been seeking less mechanical realities by delegating routine tasks to machines. In this age of automation, how do we endow human-like capabilities to autonomous systems and robots? The means to achieve these goals typically demand the use of control systems that execute 'control strategies'. In our undergrad control systems course, we learn the fundamental concepts that are absolutely relevant in the industry to date and related jargon such as feedback and stability. In this presentation, let's get a sneak peek into the wide world of control systems from optimal to adaptive control techniques and finally zooming out to active research directions pursued by the control community.

About the Speaker

Janani Venkatasubramanian is a **PhD student at the University of Stuttgart in the International Max Planck Research School for Intelligent Systems**. Prior to this, in 2018, **she completed her master's degree in electrical engineering at TU Delft in the Netherlands**. Before that, she worked for almost a year **at the Aerospace department in IISc as a project assistant**. In 2015, she graduated with a **bachelor's degree in electronics and communication engineering from CMRIT, Bangalore**.

Webinar proceedings - In brief.

The event started at 4 P.M with a welcome speech by **Dr. T.Y. Satheesha., Assoc. P, HOD**, Dept. of Electronics and Communication. He welcomed the speaker of the event **Janani Venkatasubramanian** (Doctoral Student, International Max Planck Research School for Intelligent Systems, Pfaffenwaldring 9, 70569 Stuttgart, Germany), The Honourable **Pro-Vice Chancellor Dr. Suresh K.S**, CMR University, Dr. Jayaprasad M, Dean, School of Engineering and Technology, CMR University, Faculties and participants of the event.

The Honourable **Pro-Vice Chancellor Dr. Suresh K.S** addressed the participants with his inspirational words and briefed the importance of this webinar.

Dr. Jayaprasad M, Dean, School of Engineering and Technology, motivated the participants by briefing the prominence of Control systems in current technology.

Dr. Muralishankar R. Professor, Dept. of Electronics and Communication, who is the pioneer in organizing this event, briefed about the webinar to the participants and its significance.

The session was auspiciously started with an invocation song by Prof. Divyashree N, Assistant Professor, Dept. of Electronics and Communication Engineering.

Then Prof. Baby Chithra, Assistant Professor, Dept. of Electronics and Communication Engineering, welcomed the guested by introducing them.

The speaker **Janani Venkatasubramanian** started with the introduction of control system basics, system properties, the relevance of linear model, using root locus, Bode method, to tune the PID controller. The discussion continued on the accuracy methods, the cases where the trajectory is not stable, and the applications of PID in industry. The problems such as uncertainty in systems were addressed. The control theory branch says how that the system is designed to get high performance.

The branches of control theory such as model predictive control, learning control, fuzzy control, stochastic control, hybrid control, multivariable control were briefed. The speaker introduced her work which is model predictive model (MPC). The detailed explanation about the MPC was given. Predict future behaviour using a system model, given measurements or estimates of the current state of the system and a hypothetical future input trajectory or feedback control policy.

What if a model is not available? The systematic model in deep space form is the solution. What if the model has noise? The robust MPC is used in this case.

The QnA session was addressed by the speaker and Dr. Muralishankar R, where in the students were explained about the doubts in clear way.

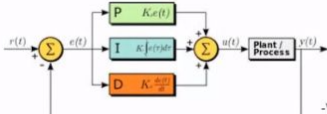
Finally, Prof. Vasanthi D R, Assistant Professor, Dept of ECE, gave vote of thanks to the speaker and to all the participants.

Screenshots of the Webinar

REC Janani Venkatasubramanian is presenting

Control Systems Basics

- System Properties
 - Representations (block diagrams, signal flow graphs)
 - Controller Design (PID and its variants)
 - Analyses and System properties
 - Time Domain Analysis (State-space analysis, observability, controllability, etc.)
 - Frequency Domain Analysis
 - Laplace Transform, Fourier Transform, Z Transform
 - Stability Analysis (Pole Zero Analysis, Routh-Hurwitz)
 - Performance Analysis (Root Locus, Bode plots, Nyquist analysis)



Relevance? Huge in industry!
-Wikimedia Commons

International Webinar

People (54)

Chat

You 4:00 PM
Hello Janani Mam.

Janani Venkatasubramanian 4:01 PM
Hello sir

ABEY ANTONY 17BTEC001 4:01 PM
happy teacher's day :)

PARAMJEET SINGH 17BTEC025 4:05 PM
Happy teachers day

Dr. Satheesha T.Y 4:09 PM
Tq all

Puneetha P 4:09 PM
Thank you all

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REC Janani Venkatasubramanian is presenting

Branches of Control Theory

Model Predictive Control

Learning Control

Fuzzy Control

Stochastic Control

Robust Control

Adaptive Control

Hybrid Control

Multivariable Control

Optimal Control

Digital Control

Nonlinear Control

POSHAK S 19BBTEC031 has left the meeting

International Webinar

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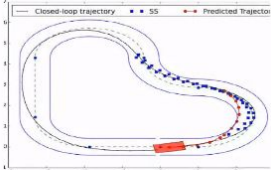
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Model Predictive Control (MPC)

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- MPC Lab @ UC Berkeley

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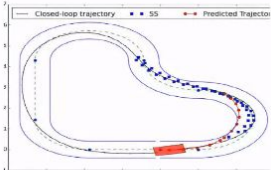
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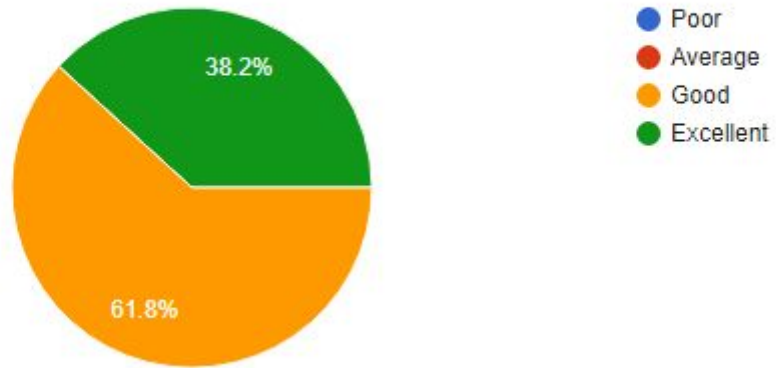
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Feedback from the webinar participants

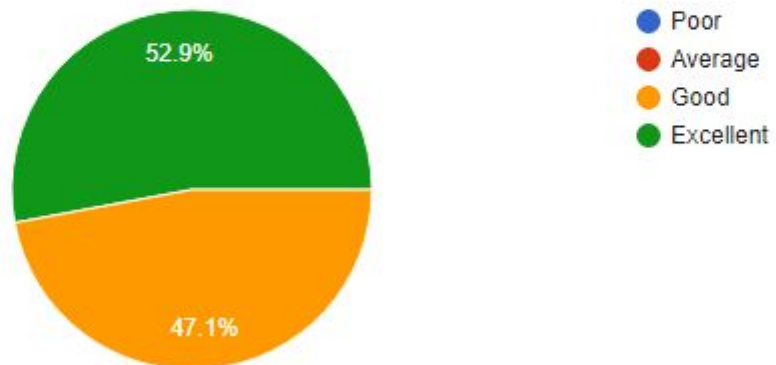
1. How useful to you was the information presented in the webinar?

34 responses



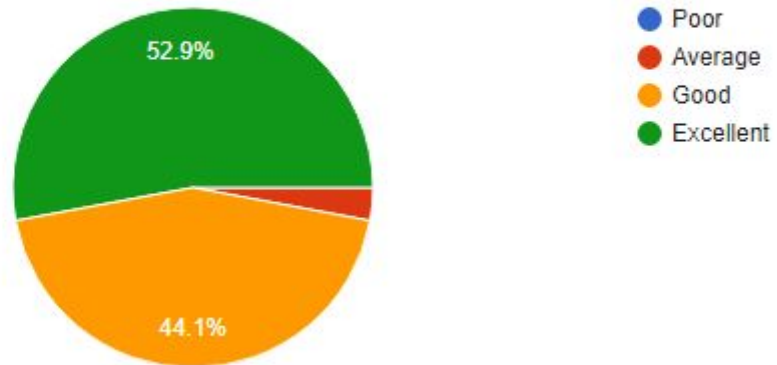
2. How organised was the information presented at the webinar?

34 responses



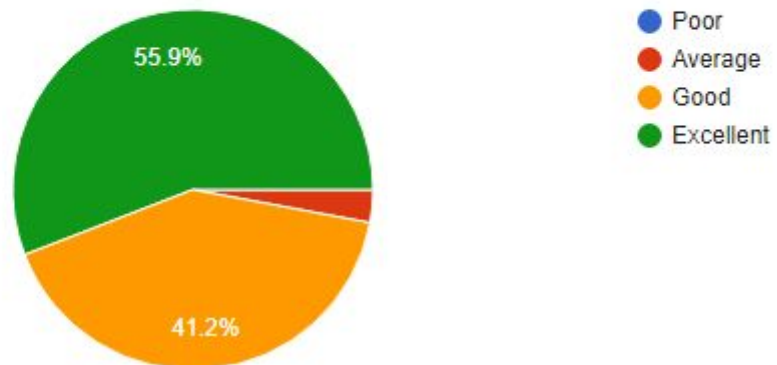
3. How would you rate the presenter?

34 responses



4. How organised was the webinar?

34 responses



5. How do you rate Q&A session at webinar?

34 responses

