IEEE Berkshire Section Newsletter

Update: December 2022

Berkshire Section
http://www.ieee.org/berkshire

1 December 2022

Dear Member:

The nominating committee has proposed the following slate for the 2023 IEEE Berkshire Section
Officers:

Section Chair	**James McVeigh**
Section Vice Chair	**Rich Kolodziejczyk**
Treasurer	**Roger Manzolini**
Secretary	**Dave Rueger**

Anyone wishing to submit a member for one of the offices should submit the name along with a letter indicating willingness to serve and endorsements of ten current members. Send the nomination and endorsements no later than December 16, 2022 to the nominating committee at:

David Rueger, Secretary
IEEE BERKSHIRE SECTION
172 Orchard Road, Dalton, MA 01226.

NOMINATING COMMITTEE: GEORGE HAUS and GEORGE GELA.

David Rueger

Secretary
IEEE Berkshire Section

Computer & Control Chapter Presented: October 11

High-Gain Observers In Nonlinear Feedback Control

By
Hassan K. Khalil, Ph.D., E.Eng.
Michigan State University

High-gain observers play an important role in the design of feedback control for nonlinear systems. This lectures covered the essentials of this technique. After a brief historical background, a motivating example were used to illustrate the main features of high-gain observers, with emphasis on the peaking phenomenon and the role of control saturation in dealing with it. The use of the observer in feedback control was discussed and a nonlinear separation principle was presented. The use of an extended high-gain observer as a disturbance estimator was covered. Challenges in implementing high-gain observers were discussed, with the effect of measurement noise as the most serious one. Techniques to cope with measurement noise were presented. The lecture ended by listing the speaker's experience with experimental testing of high-gain observers.

Dr. Hassan K. Khalil received the B.S. and M.S. degrees in electrical engineering from Cairo University, Egypt, in 1973 and 1975, respectively, and the Ph.D. degree from the University of Illinois, Urbana-Champaign, in 1978, all in electrical engineering.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0
IEEE Member Attendance: 1

Berkshire Consultants Network Presents: July 19

The Metaverse: How Communications Engineering is Shaping Our Future

This student resource & webinar series featured an IEEE technical society or community with related activities for pre-university students and a free digital badge!

This featured The Metaverse. The Metaverse: How Communications Engineering is Shaping Our Future. Prof. Frank H.P. Fitzek, Chair Head, TU Dresden, shared his work in metaverse, the tactile internet and the need for novel communication approaches. The resources shared in the webinar and in the TryEngineering student resource can be used to help students explore, engage, and get inspired.

Presenters:

Frank H. P. Fitzek: A Professor and head of the "Deutsche Telekom Chair of Communication Networks" at TU Dresden coordinating the 5G Lab Germany

Lynn Bowlby: Program Specialist Educational Outreach, IEEE Educational Activities. Lynn has been an IEEE professional staff member.

Dawna Schultz: Senior STEM Outreach Education Manager, IEEE Educational Activities.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0

IEEE Member Attendance: 1

Life Member Affinity Group Presented Annual Dinner

Meeting: May 6

2022 IEEE Berkshire Section STEM Research Challenge

Presentations by Research Challenge Winners

The following winners are students from the Berkshire County high schools' grades 9, 10, 11 and 12. We recognized the winning papers with our usual awards to students for their topic research and interesting discoveries.

Grades 9/10 prizes: (1st - $800, 2nd - $400, 3rd - $200)

1st – Annika Ziegler - Grade 9, Miss Hall's School
"Oncolytic Viruses- Killing Cancer Softly"

2nd – Sophie Gentleman - Grade 10, Miss Hall's School
"Complex Solutions for Complex Diseases: Aldosterone and Hypertension"

3rd – Jing Chen - Grade 9, Miss Hall's School
"Coral bleaching and Environment Problems"

Grades 11/12 prizes: (1st - $800, 2nd - $400, 3rd - $200)

1st – Fernanda Morais Loroca - Grade 11, Miss Hall's School
"Evaluating Correlations between Mass and Localization of LIGO/Virgo Detections of Gravitational Waves"

2nd – Isabella Lovato - Grade 11, Lee Middle and High School
"Lessons From the Australian Bushfires"

3rd – Emma Adelson - Grade 12, Miss Hall's School
"To Spay, Or Not To Spay"

Berkshire Section members, students and their guest.

From left to right: Annika Ziegler (1st in Grades 9-10), Emma Adelson (3rd in Grades 11-12), Sophie Gentleman (2nd in Grades 9-10), Jing Chen (3rd in Grades 9-10), Isabella Lovato (2nd in Grades 11-12)
Missing winner: Fernanda Morais Loroca (1st in Grades 11-12)

From Award Chairman:

Rich Kolodziejczyk our Vice-Chairman, announced the winner of the 2022 Member Child Award and winner was Emily Rueger: with a $100 award.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 17

IEEE Member Attendance: 6

Life Member Affinity Group Presented Webinar: April 7

Explainable AI: Hope and Hypes in Healthcare

The Need for Explainable AI in Healthcare

Dr. Hongfang Liu is professor of Biomedical Informatics at the Center for Clinical and Translational Sciences at Mayo Clinic. Dr. Liu's primary research focus is to facilitate the secondary use of clinical data for clinical and translational science research and health care delivery improvement using data science, artificial intelligence, and informatics approaches. Her research has been extensively funded by the National Science Foundation and the National Institutes of Health (NIH) since 2003. She is a Fellow of the American College of Medical Informatics and Deputy Editor of Health.

Making AI Models Interpretable and Explainable for Medical Image Analysis

Dr. Tafti is an Assistant Professor of Computer Science at the University of Southern Maine, where he is leading the USM HexAI Research Laboratory. Dr. Tafti received his PhD in computer science with an emphasis on artificial intelligence and 3D computer vision. He is passionate about AI and its applications in healthcare.Dr. Tafti is the 2021 SiiM Imaging Informatics Innovator awardee, Mayo Clinic Transform the Practice awardee, an NVIDIA GPU awardee, and GE Healthcare Honorable Mention awardee. To date, he has authored 45+ peer-reviewed publications. Dr. Tafti has organized numerous workshops and tutorials on intelligent health systems and has served on the program committee of 15+ conferences, symposiums, and journals in AI and Digital Health Sciences.

Explainable AI in Clinical Natural Language Processing

Dr. Wang is vice chair of research and assistant professor with a primary appointment in the Department of Health Information Management, School of Health and Rehabilitation Sciences, and secondary appointments in the Intelligent Systems Program, School of Computing and Information, and the Department of Biomedical Informatics, School of Medicine, at the University of Pittsburgh. His research interests focus on artificial intelligence (AI), natural language processing (NLP) and machine learning methodologies and applications in health care. His research goal is to

leverage different dimensions of data and data-driven computational approaches to meet the needs of clinicians, researchers, patients and customers. He joined Pitt in June 2021 from the Mayo Clinic where he still holds an adjunct Assistant Professor position.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0
IEEE Member Attendance: 2

Berkshire Consultants Network Presented: 30 March

SOCIAL MEDIA POWER HOUR: AMP UP YOUR SOCIAL SKILLS IN 60 MINUTES

IEEE-USA Livestream Tutorial and Q&A

Social media is a powerful tool if used well, but can be ineffective or even detrimental if used poorly. This webinar presented a broad overview of how to effectively use social media for greater impact. Platforms covered include Facebook, Twitter, Instagram, LinkedIn, and YouTube.

This session covered the following:

- The elements of a good social media post
- How to effectively use images and video
- How to vary tactics between social media platforms
- How to drive engagement

Whether one is a complete novice or have been using social media for years, one finish this hour with actionable tips to help you gain more traction on the most popular platforms. Questions from attendees were encouraged.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0
IEEE Member Attendance: 3

Power Chapter Presented a WebEx: February 28

HIGH POWER AND DYNAMIC WIRELESS CHARGING OF ELECTRIC VEHICLES

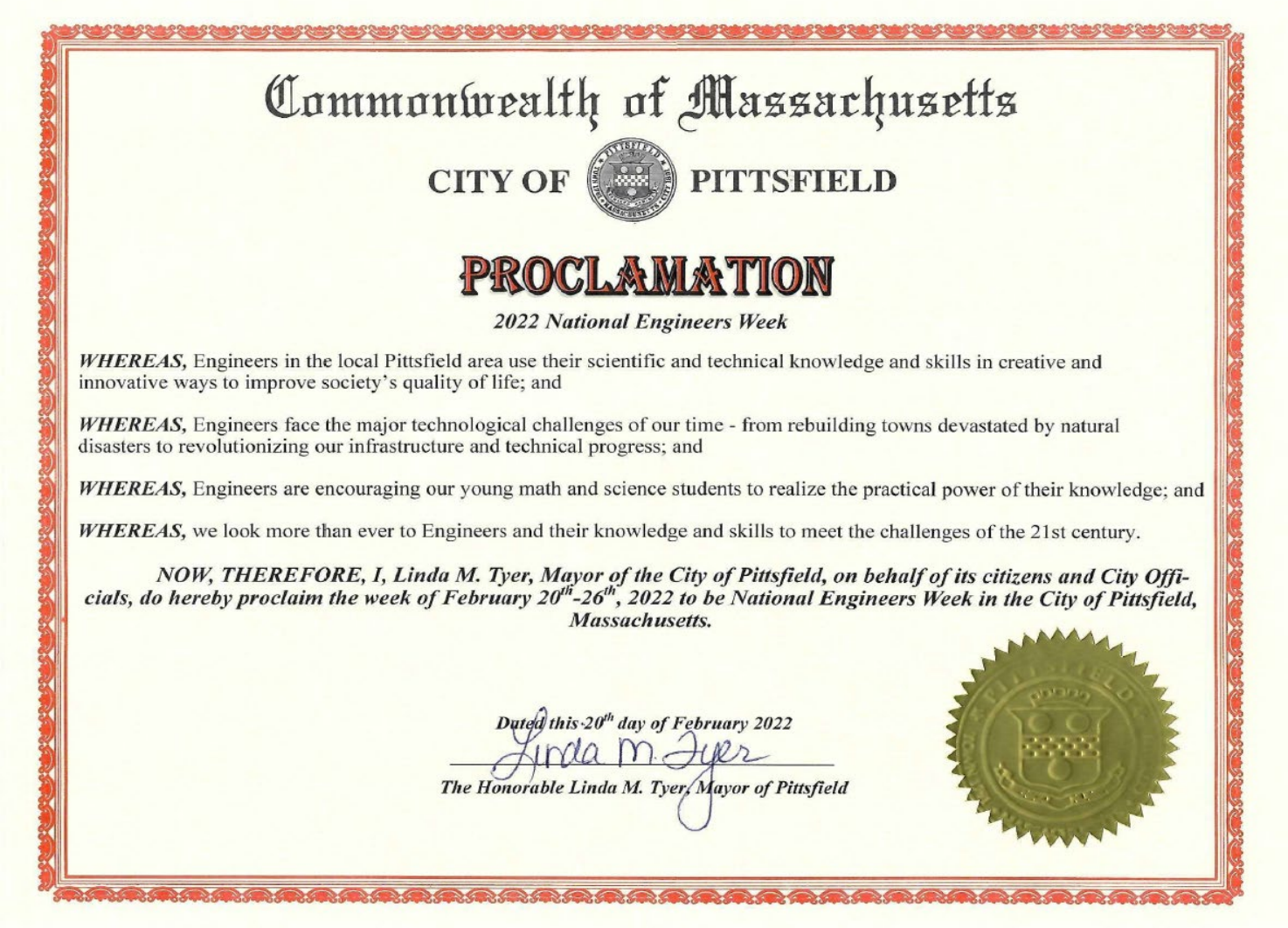
BY

Veda Prakash Galigekere, Ph.D

Dynamic charging or dynamic wireless power transfer (DWPT) can significantly alleviate range anxiety and concurrently reduce the on-board battery capacity required, there by reducing the weight, volume, and cost of EVs. Transferring power at higher levels (~ 200 kW) will lead to reduction of percentage of roadway or infrastructure that needs to be electrified thereby making the technology more viable. Existing wireless charging technology for LD vehicles is limited to 20 kW charge rates; this is not sufficient for most dynamic DWPT applications, especially at higher vehicle speeds. In some applications, five or more 20 kW systems have been used in parallel to achieve higher power levels. Although this may be a reasonable approach for MD and HD vehicles, it is not practical for light-duty passenger vehicles where space is limited and fitting more than one or two coil assemblies on the vehicle is infeasible. This seminar focussed on the challenges and ORNL's approach to overcome them to enable a practicable 200 kW dynamic wireless EV charging system.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0
IEEE Member Attendance: 2

Proclamation for 2022 National Engineers Week:



Commonwealth of Massachusetts

CITY OF PITTSFIELD

PROCLAMATION

2022 National Engineers Week

WHEREAS, Engineers in the local Pittsfield area use their scientific and technical knowledge and skills in creative and innovative ways to improve society's quality of life; and

WHEREAS, Engineers face the major technological challenges of our time - from rebuilding towns devastated by natural disasters to revolutionizing our infrastructure and technical progress; and

WHEREAS, Engineers are encouraging our young math and science students to realize the practical power of their knowledge; and

WHEREAS, we look more than ever to Engineers and their knowledge and skills to meet the challenges of the 21st century.

NOW, THEREFORE, I, Linda M. Tyer, Mayor of the City of Pittsfield, on behalf of its citizens and City Officials, do hereby proclaim the week of February 20th-26th, 2022 to be National Engineers Week in the City of Pittsfield, Massachusetts.

Dated this 20th day of February 2022

Linda M. Tyer

The Honorable Linda M. Tyer, Mayor of Pittsfield

Computer & Control Chapter Presented: February 03

Artificial Intelligence AI Webinar
(Live via Zoom)

The Webinar via Zoom consisted of 1-hour Artificial Intelligence Webinar with speakers and Q&A:

Alina Zare, Professor of Electrical & Computer Engineering, University of Florida

Haiyi Zhu, Assistant Professor of Human-Computer Interaction, Carnegie Mellon University

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0
IEEE Member Attendance: 3

Power Chapter Presented a Webinar: January 19

Solar Integration:
Interconnections and Protective Relay Systems

Integration of solar projects into the grid requires project proponents to meet a variety of requirements. Some of these are common to all projects and some are specific to solar projects. This presentation provided a general requirement for interconnection and then focused on particular needs for solar projects. Special attention was given to the protective relay system. This consisted of reviewing the FERC Orders, NERC Standards, ISO/RTO and transmission provider requirements, IEEE and other Standards and utility practices.

Meeting contact: Rich Kolodziejczyk, P.E.
Guest Attendance: 0
IEEE Member Attendance: 2

2022 Berkshire Section Officers:

On January 19, the EXCOM has voted new Berkshire Section Officers:

Section Chair	James McVeigh
Section Vice Chair	Rich Kolodziejczyk
Treasurer	Roger Manzolini
Secretary	Dave Rueger

The NOMINATING COMMITTEE consisted of George Haus, Bert Pritchard, and George Gela.