

## **Topic: Power Electronics for Precision Farming with Substantiable and Cleaner Environment**

In this lecture a broad review of vehicles for farming operation will be given starting from tillage to crop harvesting. Vehicle that has significant use of power electronics will be covered such as Exact Emerge Planter for seeding operation. This presentation will cover how power electronics supports crop-care system to exactly apply prescription such as fertilizers, pesticides, fungicide, etc. Idea is to create awareness that power electronics professionals could enable increased productivity so that by 2050 over 9.5 billion could have food, shelter, and an efficient transportation system. This talk will also cover how vehicle electrification enables many functions, forms, and features in off- and on-highway vehicles that were not cost- and space-effective possible without SiC and GaN devices.

**Dr. Brij N. Singh is a Technical Fellow - Power Electronics Engineering in John Deere Inc., USA.**

**Brij N. Singh, Ph.D.**

John Deere Region 4 Manager External Relationships  
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IEEE PELS Distinguished Lecturer 2021-2022

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### **Profile of Speaker :**

He has earned BE degree in Electrical Engineering from Madan Mohan Malviya Technical University, Gorakhpur, ME degree from Indian Institute of Technology Roorkee, and Ph.D. degree from Indian Institute of Technology, New Delhi, India.

In 1996, Dr. Singh joined the École de Technologie Supérieure, Université du Québec, Montreal, QC, Canada, as a Post-Doctoral Fellow. In 1999, he joined Concordia University, Montreal, QC, Canada as a Research Fellow. In 2000, he joined the Department of Electrical Engineering and Computer Science, Tulane University, New Orleans, Louisiana, as an Assistant Professor.

In 2007, Dr. Singh has joined John Deere Inc., USA as a power electronics staff engineer, where he has led and supported power electronics technology development projects for 644 and 944 hybrid loaders' electrification. In 2011, he joined John Deere Advanced Technology Department and has executed R&D projects related to high-temperature power-dense high-efficiency power electronics systems including wide bandgap (WBG) power conversion technologies.

In September 2020, Dr. Singh was named as the John Deere Region 4 Public Funding Manager with job title as R4 Manager External Relationships. As the R4 Manager

External Relationships, Dr. Singh is tasked to lead John Deere Emerging Technology projects including successful execution of government and non-government funded projects in collaboration with universities, government labs, non-Deere industries. Emerging Technology projects led by Dr. Singh are likely to be applicable to John Deere Tech Stack, Production Systems, Product Lifecycle Systems, Construction and Road Building. Various projects led by Dr. Singh are destined to reduce greenhouse gas emission and carbon footprint reduction, resulting in a sustainable environment for the society.

Dr. Singh has published over 90 research papers in various Journals including IEEE Transactions and IET Journals. He has 28 approved US patents, one trade secret, and over a dozen pending patents.

In Tulane, Dr. Singh received four IEEE/Eta Kapa Nu teaching awards for outstanding instructions in electrical engineering. In John Deere, he has received three innovation and one collaboration awards for product and technology development works. Dr. Singh is the winner of the 2020 IEEE Power Electronics Emerging Technology Award. In Feb 2020, Dr. Singh was awarded the “Title of John Deere Fellow” for exemplary contributions to the power electronics engineering. He is a senior member of the IEEE and lives with his family in West Fargo, North Dakota, USA.

**Panel members:**

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