

IEEE Introduction to Edge Computing

New Course Program Coming Q3 2018

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With the proliferation of Internet of Things (IoT) and the burgeoning of 4G/5G network, the IoE (Internet of Everything) era is now a reality. Huge volumes of data generated by things are immersed in daily life and hundreds of applications will be deployed at the edge to consume these data.

Cloud computing as a big data processing platform is not efficient enough to support these applications:

- Available computing capacity in the centralized cloud cannot keep up with the explosive computational needs of massive data being generated
- Users get frustrated with longer latency caused by the data movement between the edge and the cloud
- Data owners in the edge have legitimate privacy and security concerns
- Edge devices have energy constraints

These issues in the centralized big data processing era have helped launch a new computing paradigm, edge computing, which calls for processing the data at the edge of the network.

Leveraging the power of cloud computing, edge computing has the potential to address the limitation of computing capability, the concerns of response time requirement, bandwidth cost saving, data safety and privacy, as well as battery life constraints.

In this dynamic program from IEEE users will learn what edge computing is, and then explore several practical applications, ranging from cloud offloading to smart home and city, as well as collaborative edge. Users will also discover several challenges and opportunities in the field of edge computing.

Courses include:

- Overview of Edge Computing
- Practical Applications of Edge Computing
- The Challenges of Edge Computing
- Designing Security Solutions for Edge, Cloud, and IoT
- Tools and Software for Edge Computing Applications



About the Lead Editor of this Program

Professor Weisong Shi is a well-known leader in edge computing. He co-founded the ACM/IEEE Symposium on Edge Computing (SEC) in 2016 and served as the founding steering committee chair.

IEEE Introduction to Edge Computing Quick Facts

Five courses designed by leading experts in the field of edge computing

Provides a comprehensive overview of edge computing, including applications, security, tools, and more

Convenient online courses are available anytime on any internet-enabled device

CEU or PDH certificates awarded upon successful completion of the program

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IEEE Introduction to Edge Computing Course Program

IEEE Introduction to Edge Computing Course Listing

Overview of Edge Computing

Learn why edge computing is a new and important development in the computing landscape.

Practical Applications of Edge Computing

This course introduces the application scenarios of edge computing. Three real-world applications including smart home, public service, and the autonomous vehicle will be covered in this course along with the discussion of the benefits and challenges by employing Edge computing. This course will be instructional for practitioners in their designing and developing of their Edge computing applications.

The Challenges of Edge Computing

A discussion of some of the major challenges facing edge computing. Not exclusively, these major challenges range from the underlying infrastructure construction to the programming model design, from the resource discovery to application QoS demand and optimizations. Attention must also be given to the security and privacy at each layer of this new computing paradigm.

Designing Security Solutions for Edge, Cloud and IoT

This lecture not only analyzes the new challenges in edge computing, but also presents two novel edge-based security solutions for IoT applications. First, EdgeSec designs a novel security service that is deployed at the Edge layer to enhance the security of IoT systems. Second, the secure and efficient smart data collection framework enables secure data readings from smart grid devices based on a two-phase authentication protocol.

Tools and Software for Edge Computing Applications

This lecture serves as a high-level literature review of representatives of the most popular tools and software. The tools and software introduced in this lecture are a tip of the thousands of open-sourced or production-ready tools and software available in the community.

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