



Overview of BWAC CUA Site

Hang Liu

Department of Electrical Engineering and Computer Science

School of Engineering

The Catholic University of America

Washington, DC



The Catholic University of America

- ❖ The Catholic University of America
 - In Washington, D.C.
 - Established in 1887 by the U.S. Catholic bishops as a graduate research center
 - ◆ Started undergraduate education in 1904
 - 12 schools and 21 research facilities
 - ◆ all offer graduate and/or professional degrees
 - Faculty: ~400
 - ~3600 undergraduate and 3200 graduate students





School of Engineering

- ❖ Departments and Programs
 - Electrical Engineering and Computer Science
 - Biomedical Engineering
 - Civil Engineering
 - Mechanical Engineering
 - Materials Science and Engineering Program
 - Engineering Management Program



Department of Electrical Engineering and Computer Science

- Founded in 1930, accredited since 1938
- 12 full-time faculty members, growing
- ~120 undergraduates, 20 M.S. students, 50 Ph.D. students
- Interdisciplinary, flexible programs (Undergraduate and graduate level)
- Established experience with local government institutions (research and teaching)





BWAC CUA Site

❖ Faculty Participants:

- Hang Liu (Prospective Site Director, EECS)
- Lin-Ching Chang (EECS)
- Ozlem Kilic (EECS)
- Nader Namazi (EECS)
- Binh Tran (BE)

❖ Number of Ph.D. Students currently advised by center faculty: 26



BWAC CUA Site Planning Workshop

❖ Participants

- BTS Software Solutions
- InterDigital, Inc.
- Intelligent Fusion Technology, Inc.
- Alcatel-Lucent Bell Labs
- JEM Engineering LLC
- Henry M. Jackson Foundation
- Applied Physics Laboratory
- Naval Research Lab
- Army Research Lab



Faculty Expertise

- ❖ Wireless Communications and Networking: cognitive radio networks and dynamic spectrum management, cooperative communications, ad hoc and sensor networks, Internet of Things, MIMO-aware MAC and routing cross-layer design, satellite communications, next-generation mobile systems.
- ❖ Electromagnetics and Antennas, adaptive antenna design, beamforming, remote sensing, target detection and tracking,
- ❖ Future Internet architecture, network protocol design, information-centric networking.
- ❖ Video streaming, real-time multimedia communications, P2P systems, content distribution in mobile networks and the Internet.
- ❖ Advanced signal and image processing, compressive sensing,
- ❖ Network security, physical layer security
- ❖ Wireless healthcare, telehealth/telemedicine, biomedical instrumentation, biomedical imaging, medical informatics, pattern recognition, data mining, and other telecommunication applications.
- ❖
- ❖ Most of us had many years of industry experience before moving to academia



Research Funding

- ❖ ONR
- ❖ ARO
- ❖ AFRL
- ❖ NIH
- ❖ NSF



Current BWAC CUA Site Research Focus Areas

- ❖ Cognitive radio networks and dynamic spectrum access
- ❖ Millimeter wave communications and 5G mobile networks
- ❖ Internet of Things and sensor networks
- ❖ Future Internet architecture
- ❖ Information-centric networking
- ❖ Mobile content distribution
- ❖ Cyber security and network security
- ❖ Adaptive antenna design, beamforming
- ❖ Remote sensing, target detection and tracking
- ❖ Advanced signal and image processing, compressive sensing
- ❖ Wireless healthcare and telemedicine



BWAC CUA Synergy with Other Sites

- ❖ Some topics are unique to CUA site
 - Internet of Things
 - Future Internet architecture
 - Mobile content delivery and information-centric networking

 - Other topics are complementary to other sites
 - Cognitive radios
- mmWave
- Telemedicine
- Security

- ❖ We are more focus on higher-layer networking architecture, algorithms, protocols, and applications.