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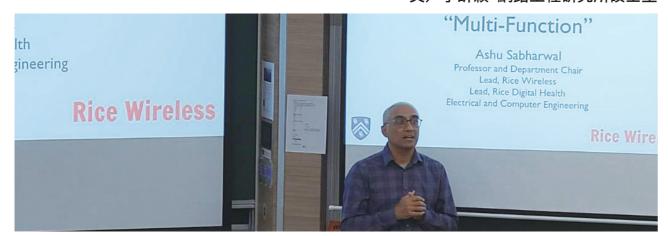
萊斯大學 Ashutosh Sabharwal 教授演講
Next-generation Wireless Networks will be "Multi-function"

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　　Ashutosh Sabharwal 教授是美國著名大學萊斯大學 (Rice University) 電機與電腦工程系的系主任兼 Ernest Dell Butcher 講座教授。他同時擁有 IEEE Fellow、ACM Fellow 和 Fellow of National Academy of Inventors 等多項榮譽。他曾獲得多個學術獎項，包括 2021 ACM SIGMOBILE Test-of-time Award for full-duplex、2020 Best Paper (Honorable Mention) for "High Resolution Diffuse Optical Tomography using Short Range Indirect Subsurface Imaging"、ICCP 2020、2019 ACM MobiCom Best Community Contributions Award for HealthSense、2019 ACM SIGMOBILE Test-of-time Award for WARP、2018 The IEEE Communications Society Award for Advances in Communications (equivalent of the ACM Test-of-time award for Communications Theory)、2018 Teaching/Mentoring Award, Graduate Student Association、2017 IEEE Jack Neubauer Memorial Award、2011 Best Demo at mHealthSys 等。其中 ACM SIGMOBILE Test-of-time Award 相當難得，該論文必須發表於國際頂尖會議 ACM MobiCom 十年以上，經過時間的淬鍊，為學術界公認仍有極大貢獻之論文。ACM MobiCom 每年接受率約 10% - 20%，相當重視系統實作，為世界各國頂尖團隊競相發表之殿堂。Dr. Ashutosh Sabharwal 獲得 ACM SIGMOBILE Test-of-time Award 兩次，在全世界相當罕見。Ashutosh Sabharwal 教授是國際通訊領域公認的頂尖研究學者，在無線通訊系統和網路的理論和實驗方面做出了卓越的貢獻，並在國際通訊領域中扮演重要的領導角色。

　　陽明交通大學資訊學院於 2023 年 6 月 28 日邀請到 Ashutosh Sabharwal 教授進行一場關於無線網路相關研究的專題演講。在演講中，Ashutosh Sabharwal 教授首先簡要介紹了他所屬的 Rice University 以及 Sabharwal Digital Health Group 和 Sabharwal Wireless Group。他提到隨著 5G 無線系統使用大量天線來覆蓋廣泛的頻譜，我們有機會利用這些頻譜來「imaging」周圍的環境，並將此技術應用於機器人、無人車等領域。此外，Sabharwal 教授還提到他的研究團隊在過去十年間在 multi-function networks 的貢獻，包括與 self-interference 相關的研究等。最後，Sabharwal 教授介紹了他們最近在研究的領域，該研究旨在通過實驗和理論研究更全面地了解如何權衡「場景中更多的 illumination 對於 imaging」和「通過 channel 的最大能量傳輸對於 communication」所帶來的利益。

　　這次的演講活動拓寬了我們對無線通訊網路研究的視野。除了無線網路與通訊之外，還有許多其他相關領域值得深入瞭解，例如 Sabharwal 教授在演講中提到的「imaging environment」。透過這次的演講活動，我們也有機會了解他國研究生的研究方法，以及 Sabharwal 教授實驗室的最新技術進展，這對於我們未來的研究有著相當大的幫助。

Dr. Ashutosh Sabharwal, Rice University,
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Dr. Ashutosh Sabharwal, the Ernest Dell Butcher Professor and chair of electrical and computer engineering (ECE) at Rice University, USA, is recognized with titles such as IEEE Fellow, ACM Fellow, and Fellow of the National Academy of Inventors. He has earned numerous academic rewards, including 2021 ACM SIGMOBILE Test-of-time Award for full-duplex, 2020 Best Paper (Honorable Mention) for "High Resolution Diffuse Optical Tomography using Short Range Indirect Subsurface Imaging" at ICCP 2020, 2019 ACM MobiCom Best Community Contributions Award for HealthSense, 2019 ACM SIGMOBILE Test-of-time Award for WARP, 2018 IEEE Communications Society Award for Advances in Communications (equivalent to the ACM Test-of-time award for Communications Theory), 2018 Teaching/Mentoring Award from the Graduate Student Association, 2017 IEEE Jack Neubauer Memorial Award, and 2011 Best Demo at mHealthSys, etc. Among them, The ACM SIGMOBILE Test-of-time Award is exceptionally rare. The paper must have been published at the premier international conference, ACM MobiCom, for over a decade, maintaining continuous recognition for its significant contribution to the academic community. With an acceptance rate of approximately 10% - 20%, ACM MobiCom places great importance on system implementation, serving as a platform for leading teams worldwide to showcase their work. Dr. Sabharwal has received the ACM SIGMOBILE Test-of-time Award twice, a remarkably rare achievement globally. Widely recognized as a prominent research scholar in the international communication field, Dr. Sabharwal has made remarkable contributions to the theory and experimentation of wireless communication systems and networks, while concurrently playing a pivotal leadership role in the global communication community.

On June 28, 2023, Dr. Ashutosh Sabharwal was invited by the College of Computer Science at Yang Ming Chiao Tung University to deliver a special lecture on research related to wireless networks. During the speech, Dr. Sabharwal provided a concise overview of Rice University, where he is affiliated, as well as the Sabharwal Digital Health Group and Sabharwal Wireless Group. He delved into the potential of leveraging the extensive spectrum covered by the 5G wireless system, equipped with numerous antennas, for "imaging" the surrounding environment. This technology has applications in diverse areas such as robotics and autonomous vehicles. Furthermore, Dr. Sabharwal highlighted the achievements of his research team in the field of multi-function networks over the last decade, including investigations into self-interference. Concluding his presentation, he unveiled their current research focus, aiming for a comprehensive understanding of the trade-offs between "increased illumination in the scene for imaging" and "maximizing energy transfer through the channel for communication" through experimental and theoretical research.

The lecture has expanded our perspective on research in wireless communication networks. Beyond wireless networks and communication, numerous related areas, including the "imaging environment" highlighted by Dr. Sabharwal during the lecture, are worth exploring. This event provided us with the chance to understand the research methods employed by graduate students from other countries and stay updated on the latest technological advancements in Dr. Sabharwal's laboratory. Such insights are invaluable for our future research.