



DOCOMO USA Labs

DOCOMO Communications Laboratories USA, Inc.
3240 Hillview Avenue, Palo Alto, CA 94304-1201
Telephone 650.493.9600 Facsimile 650.493.9601
<http://www.docomolabs-usa.com>

06/15/2009.

U.S. Department of Homeland Security,
Citizenship and Immigration Services.

Subject: Supporting Arunesh Mishra's application towards permanent residency.

Dear Sir or Madam:

The intent of this letter is to show my support towards Dr. Arunesh Mishra's application for permanent residency in the United States.

I am a Project Manager and a Senior Research Engineer at DOCOMO Communication Laboratories, USA, Inc. located in Palo Alto, CA. I received my Ph.D. from the University of Maryland, College Park in the area of Wireless Communications and Networking. I have published over thirty conference and journal papers. I have routinely reviewed papers for all of the reputed journals in my area, including IEEE/ACM Transactions on Networking, IEEE Transactions on Wireless Communications, IEEE Transactions on Mobile Computing, IEEE Transactions on Information Theory, IEEE Transactions on Multimedia. I have served on the technical program and/or organization committees of several prominent conferences such as IEEE Packet Video 2009, ICC 2009, IEEE Secon 2008, ACM Mobicom 2008, Mobiquitous 2006 to name a few. At DOCOMO USA Labs, my research has focused on clean slate design of network architectures and protocols, media delivery, and cross-layer optimization.

My first interaction with Dr. Mishra happened when he was a PhD student and did an internship at DoCoMo labs in 2004. While he did not work with me directly, I was aware of his research project. Subsequently, I followed his research through email conversations and the papers he published. Dr. Mishra's work on wireless handoffs had several impacts on the IEEE standards and the day-to-day wireless technology we use. As one of his major contributions, he designed a novel system architecture to seamlessly handle handoffs of user sessions as users moved between different WiFi access points and/or cellular base-stations. This system was based on a graph-theoretical concept called *neighbor graphs* which captures neighborhood relationships between



DOCOMO USA Labs

DOCOMO Communications Laboratories USA, Inc.
3240 Hillview Avenue, Palo Alto, CA 94304-1201
Telephone 650.493.9600 Facsimile 650.493.9601
<http://www.docomolabs-usa.com>

Cellular/Wifi base-stations/access points. Using *neighbor graphs* he built fast and scalable algorithms and protocols that predict user mobility and manage network resources in order to provide a seamless experience to users especially during high mobility. The basic concept of *neighbor graphs* is so powerful that a wide-range of network optimizations and applications has been built on top of it.

Dr. Mishra's research work on *neighbor graphs* eventually became his PhD thesis and was also published at top-tier conferences (IEEE Infocom 2004, ACM Mobisys 2004) and journals (ACM Sigcomm CCR 2003, IEEE/ACM Transactions on Mobile Computing 2004), all of which are highly selective in their publications. This entire body of research was also patented and drew significant interest from the Industry, notably receiving sponsorship from Samsung, Inc., who subsequently included this technology in their products. *Neighbor graphs* also made an impact on the IEEE standards; he was invited to make expert presentations at the IEEE Task Group 11 Meetings and as a result, his designs and algorithms were incorporated into the IEEE 802.11f Inter-AP Communication Standard which is stated as recommended practice for all WiFi Access Points manufactured after 2004.

In subsequent years, Dr. Mishra has been involved in the program committees of highly selective workshops and conferences. His recent work on channel management has been also widely cited in the research community. Given his past and current accomplishments, I firmly believe there is more than enough evidence showing that Dr. Mishra is an invaluable asset to this country towards advancing the state-of-the-art in wireless networking and security. His skill set is very unique and it is hard to find individuals like Dr. Mishra to work in the areas of wireless networking and security. Thus, without any reservations, I support his application for permanent residency in the United States.

Sincerely,

A handwritten signature in black ink, appearing to read "Ulas C. Kozat".

Ulas C. Kozat, Ph.D.
Project Manager
DOCOMO USA Labs