



# PLENARY TALK

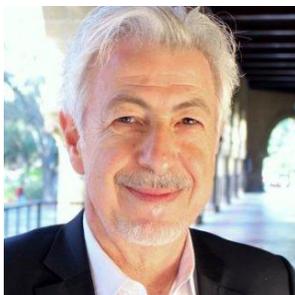
## Shaping the Future of Human-Robot Collaboration

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### Abstract:

Distancing humans physically from dangerous and unreachable spaces while connecting their skills, intuition, and experience to the task promises to fundamentally alter the future of work and remote robotic operations in extreme environments. This has been thoroughly illustrated during the recent expeditions of OceanOneK, where its advanced autonomous skills for physical interaction have been effectively combined with the cognitive abilities of a human expert through an intuitive haptic/stereo-vision interface. Skills are learned from human demonstrations, where physical models are used to reveal from motion and contact data sequences of parametrized human-like compliant strategies. During several archaeological expeditions in the Mediterranean, OceanOneK demonstrated remarkable performance in operating at deep depths. These developments show how human-robot collaboration-induced synergy can expand our abilities to reach new resources, deliver medically care to distant patients, build and maintain remote infrastructure, and perform disaster prevention and recovery operations – be it deep in oceans and mines, at mountain tops, or in space.



### Biodata:

Oussama Khatib received his PhD from Sup'Aero, Toulouse, France, in 1980. He is Professor of Computer Science and Director of the Robotics Laboratory at Stanford University. His research focuses on methodologies and technologies in human-centered robotics, haptic interactions, artificial intelligence, human motion synthesis and animation. He is President of the International Foundation of Robotics Research (IFRR) and a Fellow of the Institute of Electrical and Electronic Engineers (IEEE). He is Editor of the Springer Tracts in Advanced Robotics (STAR) series, and the Springer Handbook of Robotics, awarded the American Publishers Award for Excellence in Physical Sciences and Mathematics. He is recipient of the IEEE Robotics and Automation (IEEE/RAS) Pioneering Award (for his fundamental contributions in robotics research, visionary leadership and life-long commitment to the field), the IEEE/RAS George Saridis Leadership Award, the Distinguished Service Award, the Japan Robot Association (JARA) Award, the Rudolf Kalman Award, and the IEEE Technical Field Award. Professor Khatib is a member of the National Academy of Engineering.

