

## **Title: “Beyond Human Technology” Opens Another World**

### **Abstract:**

This talk begins by explaining what is “Beyond Human Technology”. All human actions start by perception, such as vision, tactile, hearing, tasting, and smelling sensor. For example, human vision has potential recognition capability even under various different illumination conditions, while the recognition speed is not that fast compared with the existing online high speed camera. Knowing of the limitation of human perception and action, we show how to design an artificial system leading to “Beyond Human Technology” by utilizing two kernel components, an online high speed vision and a high speed actuator where both speeds are several hundred times faster than human eye and muscle, respectively. We introduce a couple of examples in both robotics and bio/medical fields. As for robotics, we show “The 100G capturing robot”, “Two-fingered hyper human robot hand”, “Hyper plate manipulation learnt from pizza master”, and “Hyper magician”. As for bio/medical application, we first show a fast and fine cell manipulation system with the frequency of 100Hz and the resolution of 250 nanometers by using both a newly developed syringe pump and an online high speed vision. As an application of cell manipulation, we show “Cell Stress Test” where a mechanical stress is continuously imparted to a cell until it eventually gets damages. Through experiments, we found an interesting behavior of red blood cell where after several hundred times mechanical stress, the cell eventually loses any recovery characteristics. We are expecting to see some correlation between decesses and the number of stress leading to knock out state.

Finally, we will also discuss how “Beyond Human Technology” get along with AI. All topics in this talk will be explained together with video demonstration.