Context

Sheridan defined that telepresence is the ideal of the users to feelpresenting at a remote site physically through the human operator [3].Objectively, telepresence extents humans’ feeling to a mediatedenvironment through medium, rather than in the immediate physicalenvironment [5].

Draper introduces Synthetic Environment (SE), which purposesprojecting the perceptual, cognitive, and psychomotor capabilitiesof the user into a distant, dangerous, or simulated environment, atthe beginning of his essay on telepresence. Although both computer-mediated interaction and synthetic environment involve in human-machine interface design, SE subdivides into virtual reality systems,teleoperators, and telecommunications. Draper’s paper focuses onthe phenomenon related to the association of SEs and the termof telepresence, involving converting user’s self-perception into acomputer-mediated environment [2].

Based on the research on the SEs, Draper expended the definitionsof telepresence into three aspects: the simple, the cybernetic, andthe experiential. In the simple telepresence definition, it refers to theability to operate in a computer-mediated environment, controllingmachines over distance. The definition of cybernetic definition isthat the index of the quality of the human-machine interface, forexample, the operational characteristics of the human-computer-telerobot interface. In the experiential definition, telepresence meansthat a user feels physically present within a computer-mediated en-vironment. Cybernetic telepresence focuses on projecting humancapability into the computer-mediated environment, whereas experi-mental telepresence is the immersion of human consciousness intothe computer-mediated environment [2].

There are two explanatory approaches can be found in the liter-ature: Technological Approaches and Psychological Approaches.Basic on Draper’s literature review, on the one hand, technologicalapproaches, the nature of telepresence includes the actual feeling inthe remote site, the location of the real bodies, the perceives presentin a computer-meditated environment physically, and the sense ofsharing space with distant interlocutors. On the other hand, Behav-ioral cybernetics, Flow, Distal attribution, and Situational awarenessare the approaches of psychological approaches [2].

The definitions of Teleoperator and Telerobot are the key to un-derstand teleoperation. Teleoperator is a machine that enables thehuman operator to manipulate the distance objects through theircapabilities [4]. Simultaneously, Telerobot is a robot receives in-structions from teleoperator over the distance. It usually has sensorsand effectors for manipulation and/or mobility [1].

Teleoperation is mean that using human intelligence to operatea robot with adequate human-machine interface in the distance.Usually, two robot manipulators are consisted by a teleoperationsystem. The master arm, one of the manipulators, is controlledby a human operator to generate commands to map the slave armwhich is the remote manipulator [1]. With the development of theInternet, the application for teleoperation become increasingly moreextensive and indispensable. It had been used widely in hazardous\*e-mail: jie.guan@student.ocadu.caand less structured environments such as space exploration, underseainspection and maintenance, and toxic waste cleaning [1].

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