Announcing the Final Examination of Payal Jotwani for the degree of Master of Science

Time & Location: July 10, 2015 at 1:00 PM in Harris Engineering Corporation HEC 438
Title: Computerized Evaluation of Microsurgical Skills Training

The style of imparting medical training has evolved, over the years. The traditional methods of teaching and practicing basic surgical skills under apprenticeship model, no longer occupy the first place in modern technically demanding advanced surgical disciplines like neurosurgery. Furthermore, the legal and ethical concerns for patient safety as well as cost efficiency have forced neurosurgeons to master the necessary microsurgical techniques to accomplish desired results. This has lead to increased emphasis on assessment of clinical and surgical techniques of the neurosurgeons. However, the subjective assessment of microsurgical techniques like microsuturing under the apprenticeship model cannot be completely unbiased. A few initiatives using computer-based techniques, have been made to introduce objective evaluation of surgical skills.

This thesis presents a novel approach involving computerized evaluation of different components of microsuturing techniques, to eliminate the bias of subjective assessment. The work involved acquisition of cine clips of microsuturing activity on synthetic material. Image processing and computer vision based techniques were then applied to these videos to assess different characteristics of microsuturing viz. speed, dexterity and effectualness. In parallel subjective grading on these was done by a senior neurosurgeon. Further correlation and comparative study of both the assessments was done to analyze the efficacy of objective and subjective evaluation.

Major: Computer Science

Educational Career:
Bachelor's of Electronics and Telecommunication, BS, 2010, Pune University

Committee in Charge:
Hassan Foroosh, Chair, CECS
Charles Hughes, Co-Chair, CECS
Kien Hua, CECS

Approved for distribution by Hassan Foroosh, Committee Chair, on August 13, 2014.

The public is welcome to attend.