

PRODUCTION OF PHYSICAL BIO-MODEL FROM SCANNED DATA USING RAPID PROTOTYPING TECHNOLOGY

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Abstract: *The production of physical model of biological structure from scanned data using rapid prototyping technique is discussed in this paper. Manufacturing process route, the requirements and current state of the technology are presented and specific example case studies in the medical field are given. It is found that, physical model of an organ or an area of interest can help medical doctors tremendously in normal and reconstructive surgery as they can visualize, plan and rehearse the surgery in a team before going into the operating theatre. The production cost is still considerably high mainly due to unavailability of cheap alternative material and high machine utilization cost. However, it is technically feasible to directly produced physical replicates of the real human organs with the current state of the technology. The prospect of this technology and how it would affect the medical field, especially in surgery, is also discussed.*

Keywords: physical bio-modeling, rapid prototyping, medical imaging, surgery

Abstrak: *Penghasilan model fizikal struktur biologi daripada data imbasan menggunakan teknik pencontoh sulung pantas dibincangkan dalam penulisan ini. Laluan proses pembuatan model, keperluan-keperluan dan keadaan semasa teknologi dibentangkan dan contoh spesifik berkenaan kajian-kajian kes dalam bidang perubatan diberikan. Didapati bahawa model fizikal sesuatu organ atau satu kawasan pilihan pada model fizikal-bio boleh membantu doktor perubatan dalam pembedahan normal dan juga pembedahan pembinaan kerana mereka boleh memvisualisasi, merancang dan menguji cuba proses pembedahan dalam satu pasukan sebelum ke dewan pembedahan untuk melakukan pembedahan. Kos penghasilannya masih tinggi kerana kepayahan mendapat bahan alternatif yang murah di samping kos penggunaan mesin yang tinggi. Walaupun demikian, secara teknikalnya penghasilan model fizikal organ asli manusia boleh dilakukan dengan keadaan teknologi yang ada sekarang. Prospek teknologi ini dan bagaimana ia akan mengesani bidang perubatan terutamanya dalam pembedahan juga dibincangkan.*

Kata kunci: pemodelan fizikal-bio, pencontoh sulung pantas, pengimejan perubatan, pembedahan