

SIAA Simulation Achievement Award Citation

Professor Karol Miller has made one of the most outstanding contributions to the science and practice of simulation in the last decade. With his colleagues he has developed the technology required for real-time surgical simulation of body tissues such as the human brain undergoing operative procedures. This technology promises to revolutionise the training of surgeons around the world. It also opens fascinating new possibilities for developing operation procedures hitherto thought to be impractical. The simulation technology will allow engineers to develop specialised tools and equipment for micro surgery inside the brain and other human organs without having to rely on large numbers of expensive trials on humans and live animals.

Professor Miller pioneered computationally efficient methods to solve real-time dynamic behaviour of soft nonlinear human tissues. These methods can be applied both to surgical training and also online surgical planning where there is a requirement for registering MRI and X-Ray body scan images. Typically these images are collected with the body lying on its back. Surgery is often required with the body in a different position to enable access y surgeons and soft tissue organs change their shapes under these conditions. However, Professor Miller's technology allows these shape changes to be predicted accurately allowing much more precise preoperative planning.

Professor Miller's achievements have been recognised with many invitations to present his work at leading international conferences on biomechanics and medical technology. It is time that his achievements were recognised in his own country.