



i-Navi Biomedical Inc.

i-Navi Biomedical Inc.由中央大學機械系曾清秀教授及其團隊創建，在外科手術導航系統開發領域擁有20多年的經驗，是一家專門開發用於神經外科與骨科手術的影像輔助機器人手術導航系統的公司。主要的產品是基於2D/ 3D C-arm影像或CT/ CTA / MRI影像的i-Navi機器人手術導航系統，用於脊椎/腦部手術，協助外科醫師在手術過程中準確地定位手術器械和植入物，降低X射線的輻射暴露量、手術風險、與手術時間。所開發的導航系統已在國泰醫院進行了臨床測試和驗證，FDA/ TFDA申請將在一年內完成，新的技術如AI，AR等也將整合到i-Navi系統中。

現今的腦手術，外科醫生只能依據術前CT或MRI影像和臨床經驗來分析腦病變組織的解剖結構，並規劃適當的手術路徑。手術時再使用導航系統來協助手術器械的導引定位。但現今的導航系統絕大多數都只提供單一種醫學影像的三個切面視圖，欠缺病患的重要腦組織(腦溝、血管、與神經)3D視圖(圖三)，導致手術安全不確定性高、耗時又困難。I-Navi腦手術用導航系統整合了導航和AR 3D顯示，將重建的3D動脈/神經模型與患者對位對齊。AR眼鏡呈現的3D動脈/神經模型可幫助外科醫師準確規劃可以避開腦動脈的安全手術路徑，並在術中依據規劃的路徑定位手術器械。包含動脈血管的頭顱模型也可以3D列印技術進行列印，再藉由AR眼鏡顯示結合了腦動脈、手術器械、和頭顱等模型的3D場景，外科醫生即可執行手術模擬或手術訓練。我們歡迎有興趣更深入了解本產品者(外科醫師/醫材業者/投資者)跟我們聯繫，並期待未來的合作機會。



AR 輔助腦手術用導航系統  
AR Assisted Navigation System for Brain Surgery



## i-Navi Biomedical Inc.

**Introduction:** i-Navi Biomedical Inc., founded by Prof. Ching Shiow Tseng and his team members with more than 20-years' experience in surgical navigation system development, is a company specialized in developing image-assisted/robotic surgical navigation systems for neurosurgery and orthopedic surgery. The 2D/3D C-arm or CT/CTA/MRI images based i-Navi robotic surgical navigation system (robot is an option) for spine/brain surgery enables surgeons to accurately and efficiently position surgical instruments and implants during operations. Using the i-Navi navigation system in minimally invasive spine/brain surgery can significantly reduce X-ray radiation exposure, improve positioning accuracy and surgical risk, and even reduce operation time. Clinical applications of the input image assisted navigation system have been tested and validated at Cathy General Hospital and Tao-Yuan General Hospital. Filing applications for FDA/TFDA approval will be done in one year. The company's goal aims to develop advanced robotic surgical systems to assist medical treatments and improve patients' health. Integration of new technologies such as AI, AR/MR into i-Navi systems to enhance system functions and capabilities is in progress.

**Solution:** In conventional brain surgery, surgeons can only use preoperative images (CT, MRI, or CTA) and clinical experience to analyze the brain lesion tissue anatomy and plan an appropriate surgical path to avoid damaging important tissues of the brain. If the cerebral artery is injured during operation, it will cause bleeding or even death of the patient. This product integrates a CT image assisted surgical navigation system and 3D display of AR glasses to align the 3D artery model reconstructed from CTA images with the patient. The 3D intuitive visualization of the AR glasses assists the surgeon to accurately plan a safe surgical path that can avoid cerebral arteries and to position the surgical instruments according to the planned path intraoperatively. The 3D skull model containing blood vessels can also be printed using 3D printing technology. With the AR glasses, the 3D scene combining the cerebral artery model, surgical instruments and the skull model can be instantly displayed, and thus the surgeon can perform the operation simulation or surgical training. Through the physical demo of the AR based navigation system for brain surgery in Bio Asia, we expect the participants (surgeons/ biomedical industry/ investors) will gain a deeper understanding of the product and look forward to future cooperation opportunities.



AR Assisted Navigation System for Brain Surgery

