

Building an Automated Workflow for Cooperatively Controlled Robotic Mandibular Surgery

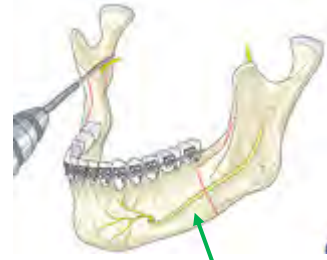


1 600.456/656 CIS2 Spring 2021

Engineering Research Center for Computer Integrated Surgical Systems and Technology

1

Operative Problem



Tongue

Cheek

Nerve within the bone.

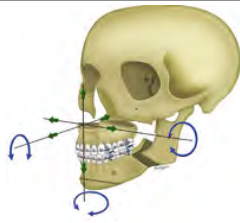


These osteotomies are all performed inside the mouth without external facial incisions.

2 600.456/656 CIS2 Spring 2021

Engineering Research Center for Computer Integrated Surgical Systems and Technology

2



Mandibular osteotomy allows repositioning in all 3 axis for correction



3 600.456/656 CIS2 Spring 2021

Engineering Research Center for Computer Integrated Surgical Systems and Technology



3

Building an Automated Workflow for Cooperatively Controlled Robotic Mandibular Surgery

- Goal: Development of a cooperatively controlled robot (CCR) attached to surgical instruments in aiding a surgeon through a mandibular osteotomy while enforcing virtual safety barriers around critical anatomical structures
- **What Students Will Do:**
 - Define the properties and preplanned workspace that have been developed originally for CCR in the temporal bone for the mandible
 - Develop virtual and 3D printed phantoms of the mandible for testing accuracy
- **Size group:** 1-2
- **Skills:** Experience in Unity and C# desirable. Experience in CIS desirable
- **Mentors:** Robin Yang MD DDS ryang14@jhmi.edu Pete Creighton MD francis.Creighton@jhmi.edu
 - Razavi CR, Wilkening PR, Yin R, et al. Image-Guided Mastoidectomy with a Cooperatively Controlled ENT Microsurgery Robot. *Otolaryngol Head Neck Surg.* 2019;161(5):852-855. doi:10.1177/0194599819861526

4 600.456/656 CIS2 Spring 2021

Engineering Research Center for Computer Integrated Surgical Systems and Technology



4