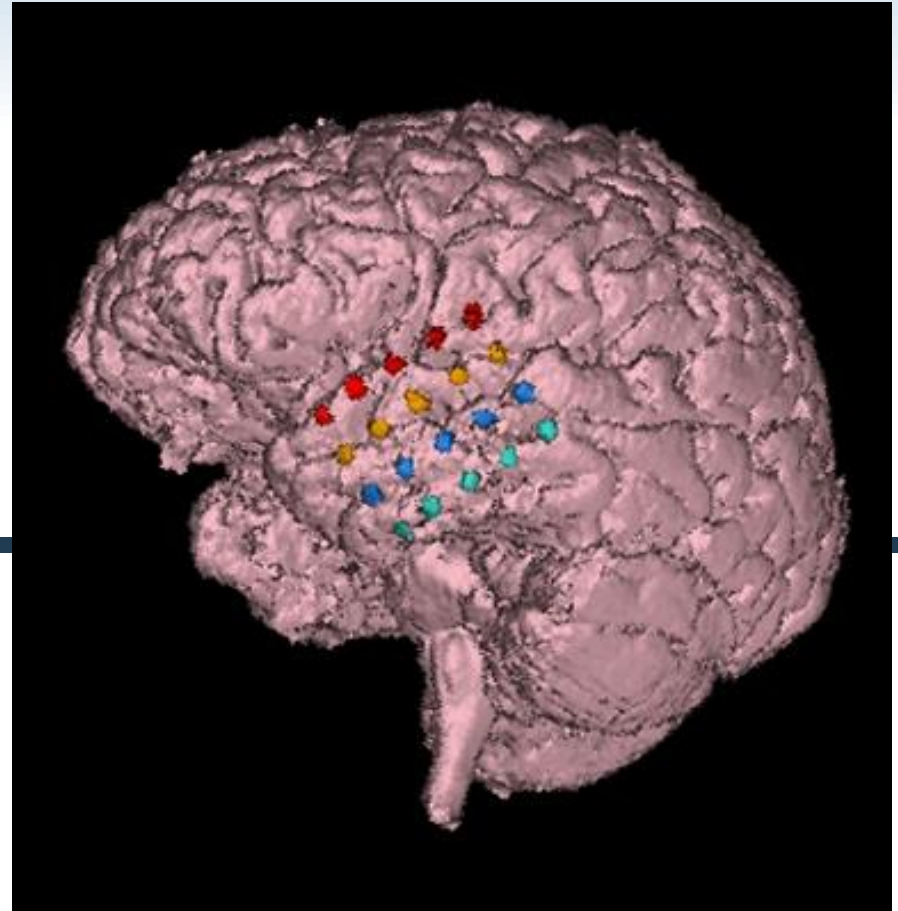


Analyze Webinar – July 28, 2011

## Electrode Grid Visualization with Analyze 10.0

Beth Farrell  
Application Specialist  
AnalyzeDirect



# Webinar Agenda

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- ◆ Estimated Duration: 30 minutes
- ◆ Webinar Agenda:
  - Intracranial EEG and utility of electrode visualization
  - Using Analyze 10.0 for electrode grid visualization
  - Questions & Answers
- ◆ Webinar Objectives:
  - To teach you how to coregister CT and MRI data
  - To provide you with information about the different types of segmentation tools available within Analyze
  - To show you how to fuse information from different imaging modalities in a 3D volume rendering

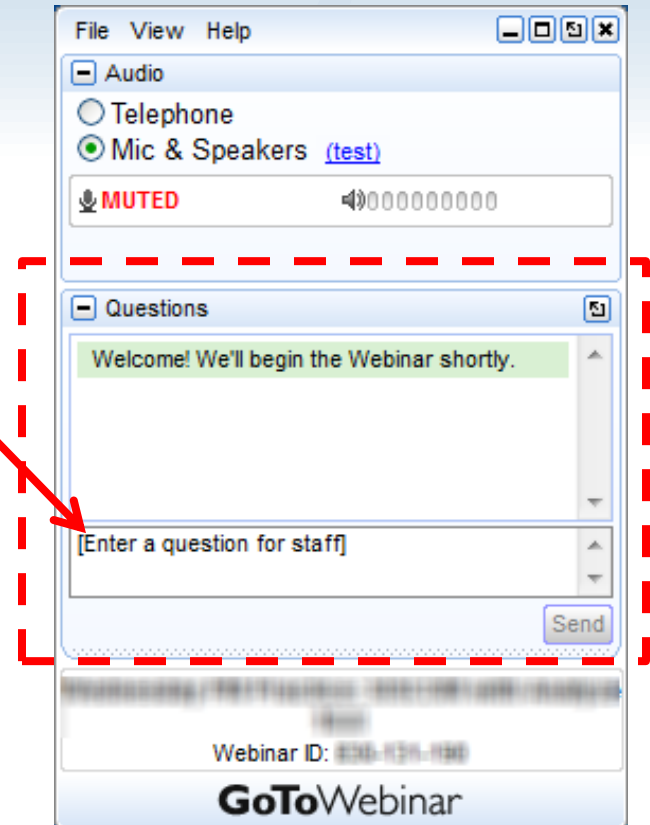
# Webinar Notes

- ◆ Questions during the Webinar

- Use “Questions” pane of your GoToWebinar control panel

- ◆ After the Webinar

- Recording and presentation materials will be available online starting tomorrow
- Webinar registrants will receive email with link to recording
  - Recording also available on the AnalyzeDirect YouTube channel - <http://www.youtube.com/user/AnalyzeDirect>



# Intracranial EEG (iEEG or ECoG)

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- ◆ Electrodes placed directly on the surface of the brain or within the brain
- ◆ Assists with seizure localization and functional mapping of eloquent cortex prior to resection
- ◆ Common indications for intracranial EEG:
  - Epileptogenic zone cannot be identified with certainty or precision
  - Other diagnostic tests are discordant
  - Seizure activity arises from areas of the functional cortex
- ◆ Types of intracranial electrodes:
  - Strip electrodes
  - Grid electrodes
  - Depth electrodes



# Intracranial Electrode Visualization

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- ◆ Knowledge of electrode position is important for proper interpretation of intracranial EEG recordings and subsequent surgical planning
- ◆ 2D imaging techniques for visualizing electrode positions:
  - X-ray
  - Surgical photographs
  - 2D MR images

# Intracranial Electrode Visualization

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- ◆ 3D representation of electrode positions on the patient's brain
  - Pre-operative 3D MR imaging
  - Post-implantation CT imaging
- ◆ Advantages:
  - Visualization of electrodes with respect to cortical landmarks
  - Not restricted to conventional orthogonal sections

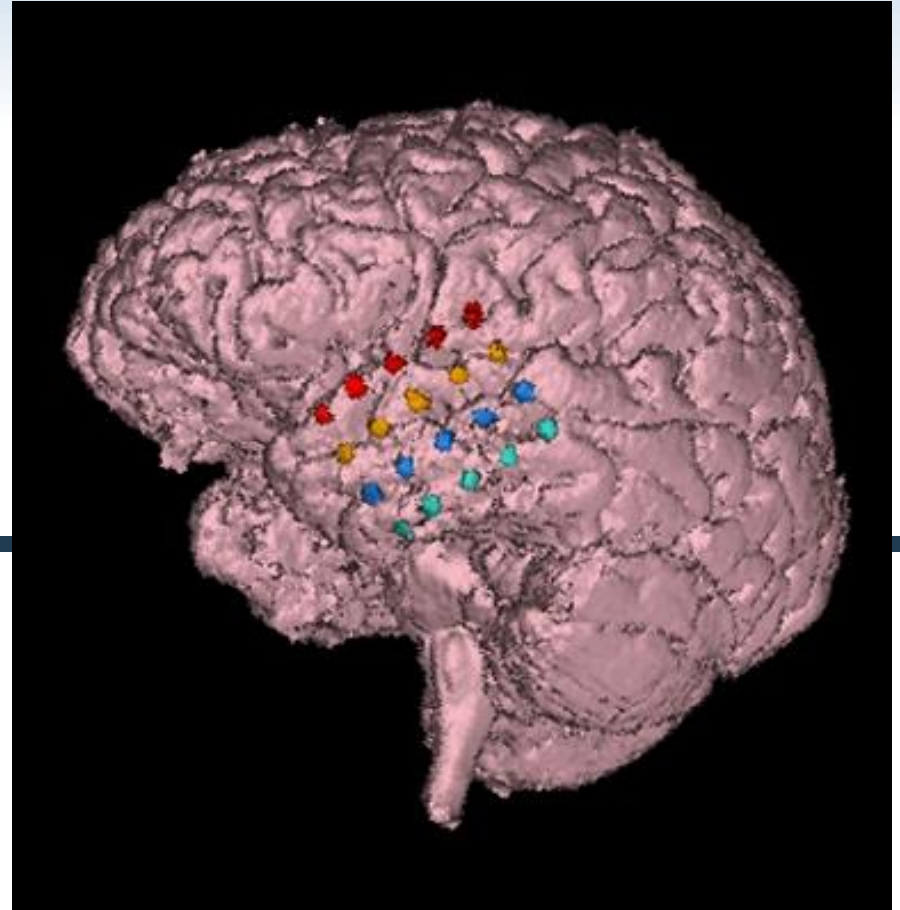
# Intracranial Electrode Visualization

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- ◆ Visualizing intracranial electrodes with Analyze 10.0:
  - Coregister a pre-operative MRI to a post-implantation CT
  - Segment electrodes from CT
  - Segment cortical anatomy from coregistered MRI
  - Create an integrated 3D volume rendering of segmented electrodes and cortical anatomy
- ◆ Modules used:
  - 3D Voxel Registration
  - Volume Edit
    - Alternative: Volume Render and Object Extractor

# Electrode Grid Visualization

with Analyze 10.0



# Intracranial Electrode Visualization

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- ◆ After electrode visualization:
  - Create more advanced renderings and movies using Volume Render
  - Output fused CT and MR images
  - Compute and output the centroid of each electrode
  - Overlay electrodes on SISCOM images
  - Mayo 3D Brain Atlas

Analyze

**Questions?**

# In Conclusion

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- ◆ Watch for an email from Analyze Webinars tomorrow
- ◆ Other helpful documents and protocols -  
[www.analyzedirect.com/support/resourcecenter.asp](http://www.analyzedirect.com/support/resourcecenter.asp)
- ◆ Evaluate Analyze 10.0 free for 30 days -  
[www.analyzedirect.com/evaluate](http://www.analyzedirect.com/evaluate)
- ◆ Suggest topics for future Webinars -  
[webinars@analyzedirect.com](mailto:webinars@analyzedirect.com)
- ◆ Contact me: **Beth Farrell**  
[beth@analyzedirect.com](mailto:beth@analyzedirect.com)  
1 (913) 653-8306