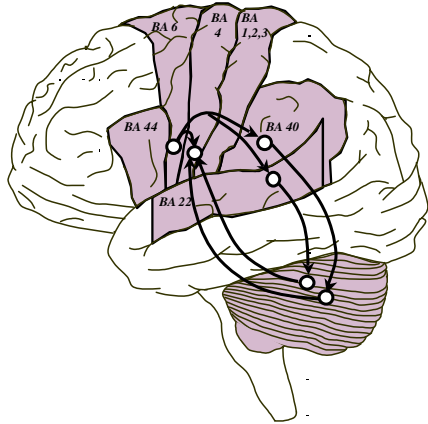


## CNS Speech Lab

Boston University

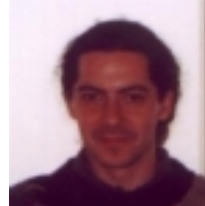
**The DIVA model of speech acquisition and production.** The central model of our research program is the DIVA model, which is a neural network that learns to control movements of a virtual vocal tract to produce speech sounds. The model's components correspond to cortical and subcortical regions:



Hypothesized neural substrate for several central components of the DIVA model.

We are starting a project this fall involving five years of fMRI and MEG experiments to test aspects of this model.

PI: Frank Guenther, Associate Professor of Cognitive and Neural Systems, BU  
Research Affiliate, Research Laboratory of Electronics, MIT

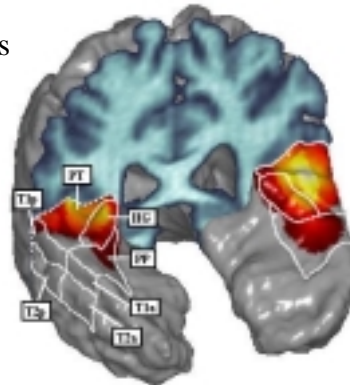


**Frank Guenther Alfonso Nieto-Castanon Satrajit Ghosh Jason Tourville**

**Overview of what we do:** The main objectives of our lab are (i) to characterize the neural processes underlying speech perception and production with neural network models, and (ii) to test these models using psychophysical experiments and functional brain imaging.

**fMRI and MEG experiments.** Our work at the Massachusetts General Hospital NMR Center involves the use of fMRI to test predictions of our models. In addition to our fMRI work at MGH, we are performing MEG experiments at MIT to test other aspects of the models.

Shown at right is an ROI-based analysis of an fMRI expt. testing our model of neural map formation in auditory cortical areas.



**Development of fMRI analysis tools.** In addition to our modeling and experimental work, we are developing a tool suite for ROI-based fMRI analysis, as well as MEG analysis. These tools are designed to integrate smoothly with the SPM software package. This project is headed by Alfonso Nieto-Castanon and Satrajit Ghosh.

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