Date

Hopf Particle Swarm: Status

# fit\_hopf\_particleswarm.m

Detail current layout of the fit\_hopf\_particleswarm.m script and discuss possible problems or edits required.

## Load data

## Compute data:

### Structural data

### Functional data:

#### Set parameters

#### Extract time series

## Compute narrowband filter

## Filter time series and compute Hilbert phase connectivity

### Extract subjectwise functional time series

#### Demeaned & filtered BOLD signal

#### Hilbert phase

### Extract instantaneous subjectwise connectivity:

#### Compute Hilbert phase synchrony

#### Compute leading eigenvector

## Optimize effective connectivity

### Set structural connections to optimize

#### Find number of nonzero connections

#### Convert structural connectivity to vector

### Set options for optimization

#### Set upper and lower bounds of optimization

#### Define options for particle swarm algorithm

### Run *particle swarm* optimization algorithm

### Fill connectivity matrix with optimized effective connectivity values

# NLDhopf.m

Detail current layout of the NDLHopf function.

## Repopulate connectivity matrix

## Set parameters:

### Weight connectivity matrix

### Time series storage array

### Others???

## Model each subject

### Initialize model

### Model BOLD activity with particle swarm algorithm

## Compute simulated functional connectivity

### Compute functional connectivity array

### Compute instantaneous functional connectivity and leading eigenvector

## Confirm fit to empirical data

### Recover assembly membership (?) vectors

### Compute KS distance from simulated to empirical FC

# Questions & Problems

Describe questions and dilemmas

## Missing or Unknown Parameter Values

### *sig*: what does this represent? Where is it set?

### *omega*: what does this represent? Where is it set?

### *dsig*: what does this represent?

## Does *Projection\_ph* represent assembly activation time series or assembly membership vectors?