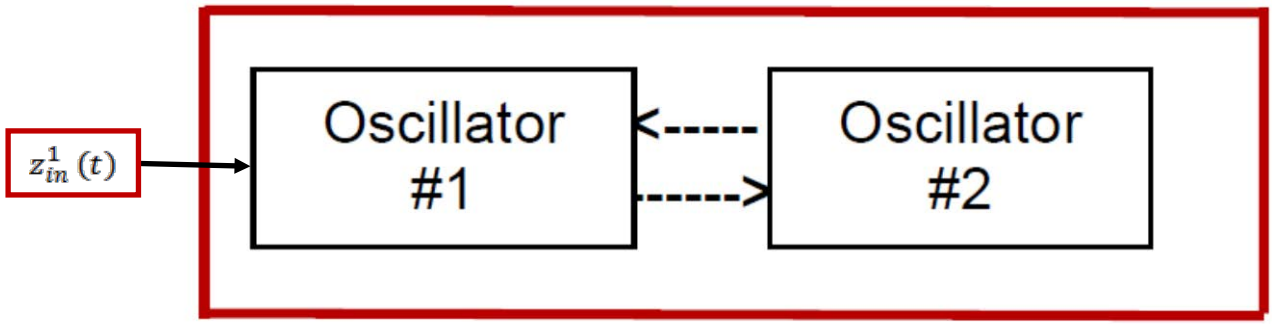
Project #2

Investigate the “nonparametric” *Wiener-Bose* and *modular Volterra models* of the bidirectionally coupled *FitzHugh-Nagumo* “parametric” *model of Project #1* under conditions exhibiting *“interesting”* behavior of the two oscillators.



Apply an input signal $z_{in}^{1}(t)$ to oscillator #1, and compute its output (to mimic applying a current and measuring the voltage in patch clamp setup).

$z_{in}^{1}(t)$ = Band-limited Gaussian White Noise *(GWN)*

- Identify the *Wiener-Bose model* parameters using the *Laguerre Expansion Technique*.
- Estimate the principal dynamic modes and identify a *modular Volterra model*.
- Compare GWN responses of the identified “nonparametric” *models* with the responses of the bidirectionally coupled *FitzHugh-Nagumo* “parametric” *model.* For model validation use GWN input signal other than the one used for model estimation.