

Chengran FANG

PH.D. STUDENT

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Education

University of Paris-Saclay

PHD STUDENT IN APPLIED MATHEMATICS AND COMPUTER SCIENCE

- Two papers accepted by NeuroImage and SIAP

Paris, France

Oct. 2019 - PRESENT

Ecole Centrale de Lyon

ENGINEERING DEGREE

- Majors: Signal processing
- One paper accepted by IEEE Antennas and Wireless Propagation Letters

Lyon, France

Sept. 2015 - June 2017

Beihang University

BACHELOR'S DEGREE IN APPLIED MATHEMATICS & MASTER'S DEGREE IN ELECTRICAL ENGINEERING

- Majors: Mathematics, Electromagnetism

Beijing, China

Sept. 2012 - Sept. 2019

Open Source Projects

Neuron Module in SpinDoctor https://github.com/SpinDoctorMRI/SpinDoctor/tree/Paper_NeuroImage_2020
Fourier Potential Method <https://github.com/fachra/FourierPotential>
swc2mesh <https://github.com/fachra/swc2mesh>

Publications

Diffusion MRI simulation of realistic neurons with SpinDoctor and the Neuron Module

NeuroImage

CHENGRAN FANG, VAN-DANG NGUYEN, DEMIAN WASSERMANN, JING-REBECCA LI

Nov. 15, 2020

- allows the numerical simulation of the diffusion MRI signal arising from realistic neurons.
- provides to the public the constructed finite element meshes for a group of 36 pyramidal neurons and a group of 29 spindle neurons whose morphological descriptions were found in the neuron repository NeuroMorpho.Org.
- provides both whole neuron meshes as well as meshes of neuron component such as the soma and dendrite branches.
- is available to the public and in open source.

Fourier Representation of the Diffusion MRI Signal Using Layer Potentials

SIAP

CHENGRAN FANG, DEMIAN WASSERMANN, JING-REBECCA LI

Sept. 17, 2022

- proposes a new method of the diffusion MRI signal based on the efficient evaluation of layer potentials.
- describes the mathematical framework and the numerical implementation of the new method.
- demonstrates the convergence of our method via numerical experiments and analyzes the errors linked to various model and simulation parameters.
- is available to the public and in open source.