

AppSFDI Matlab code v1.0

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General comments:

Thank you for using the AppSFDI Matlab code.

Please consider citing AppSFDI if you are using this code.

The AppSFDI Matlab code contains all code in Matlab format to process Spatial Frequency Domain Imaging (SFDI) datasets.

The AppSFDI Matlab code will process standard SFDI/SSOP datasets with the purpose of providing resources for investigators to engage in SFDI research.

The AppSFDI software will process any images acquired with the following properties:

- Spatial frequencies (fx): 0/mm as low frequency, and 0.1/mm or 0.2/mm or 0.3/mm or 0.4/mm as a high frequency
- Phases:
 - 1 phase: 0 degree
 - 3 phases: 0, 120 and 240 degrees
 - 7 phases: 0, 90, 180, 270, 360, 450, 540 degrees
- All acquisitions should be taken at the same wavelength
- Images should be in uncompressed format (any resolution / dynamic range)
- Two sets of acquisitions are necessary:
 - One calibration set using a tissue mimicking phantom with known optical properties
 - One sample

Every step of the process is detailed:

- Demodulation: SSOP (single phase), SFDI 3 phases and SFDI 7 phases
- Calibration: from demodulated data to diffuse reflectance
- Optical properties extraction: from diffuse reflectance to optical properties using a look-up table generated from our Monte-Carlo simulations

Details of the content:

- **Data folder:** contains calibration and sample data for 3 and 7 phases acquisitions. Note that the diffuse reflectance of the calibration phantom is provided in the Calibration_Phantom folder at 5 spatial frequencies: 0/mm, 0.1/mm, 0.2/mm, 0.3/mm and 0.4/mm.
- **Demodulation folder:** contains the m files for demodulation: single phase, 3 phases and 7 phases. Note that an additional m file (design_mask) is provided to compute the characteristics of the filters used with single phase demodulation (SSOP). *The design of a mask is always performed on a calibration phantom.*
- **OP extraction folder:** contains the m files used for computing the diffuse reflectance (compute_Rd) and extracting the optical properties (OP_extraction). Note that this folder also contains the look-up tables at the 4 high spatial frequencies: 0.1/mm, 0.2/mm, 0.3/mm and 0.4/mm.
- **Main folder:** contains a Matlab sample script (Main-Script) calling all other functions to compute step by step the optical properties from the raw data.

Thank you again for using AppSFDI and please contact us to let us know you have any comments or suggestions to improve this code.