

Perfusion Study Group: Freeware



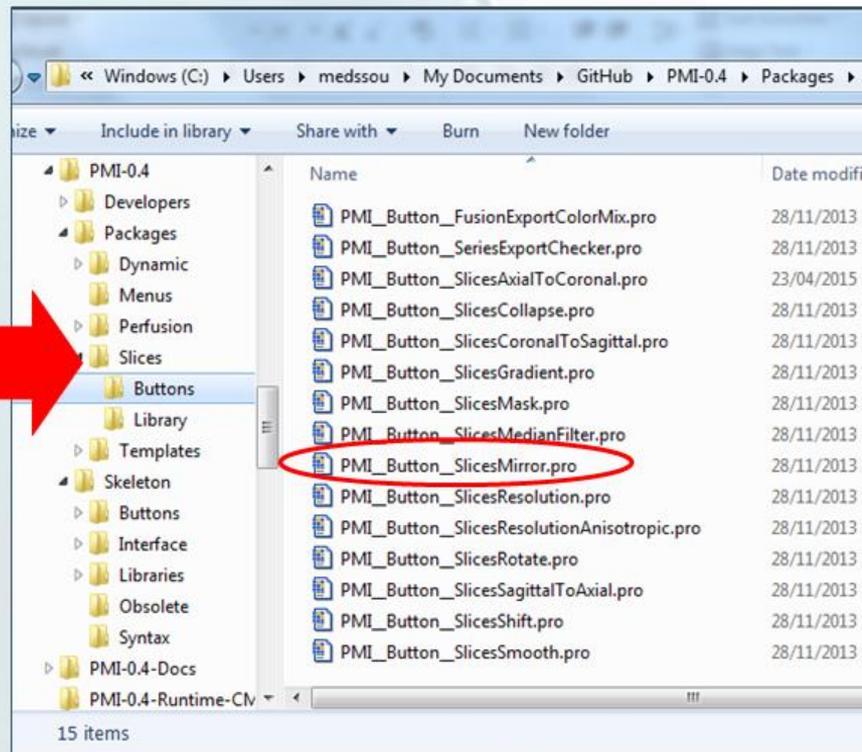
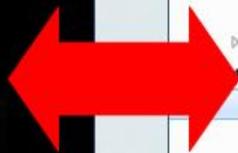
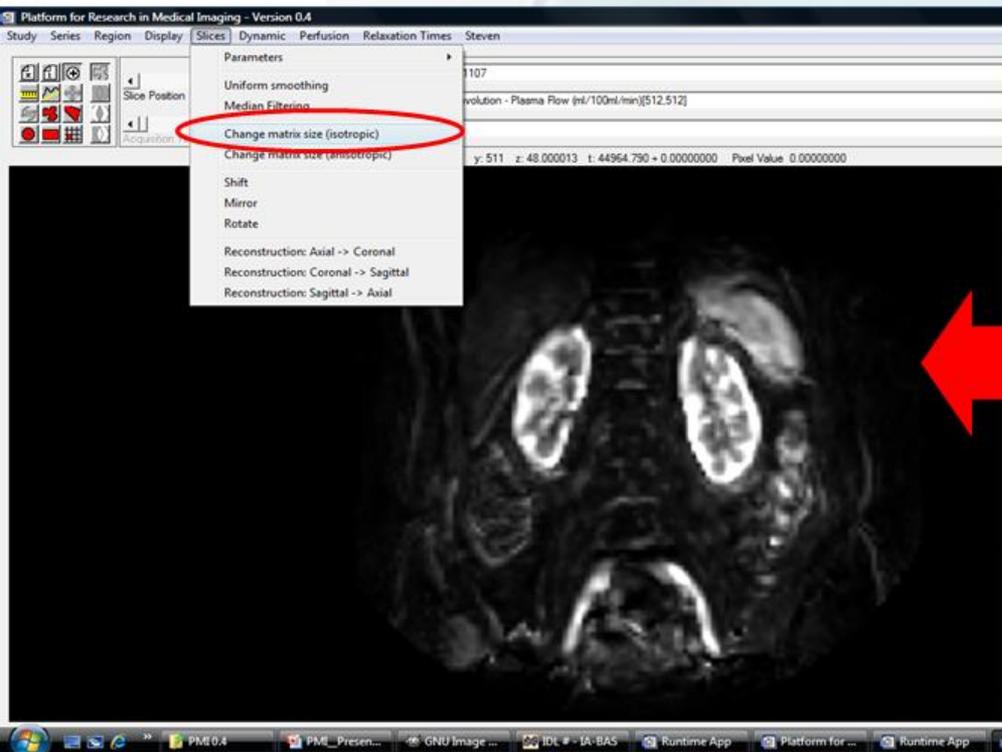
Contact name(s)	Email(s)	Location
Steven Sourbron	s.sourbron@leeds.ac.uk	Leeds, UK
Jesper Kallehauge	jespkall@rm.dk	Aarhus, Denmark
Yang Li Hanzhang Lu	yang.li@jhu.edu hanzhang.lu@jhu.edu	Baltimore, USA
Xiaoyun Liang	x.liang@brain.org.au	Melbourne, Australia
Ze Wang	redhatw@gmail.com	Hangzhou, China
Kohsuke Kudo	kkudo@huhp.hokudai.ac.jp	Sapporo, Japan



Platform for Research in Medical Imaging (PMI)

Steven Sourbron (s.sourbron@leeds.ac.uk)

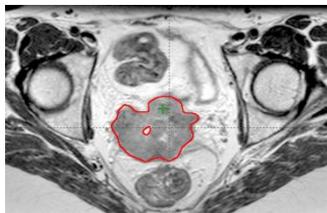
<https://sites.google.com/site/plaresmedima/>



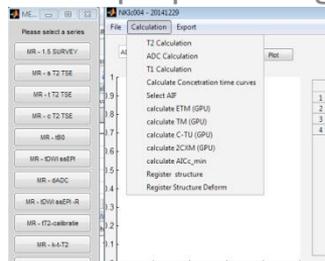
Software corner at ISMRM Perfusion Study group Meeting 2016

Workflow

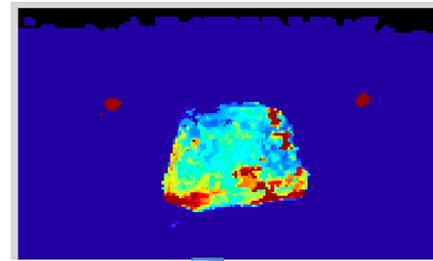
Delineate i RT software



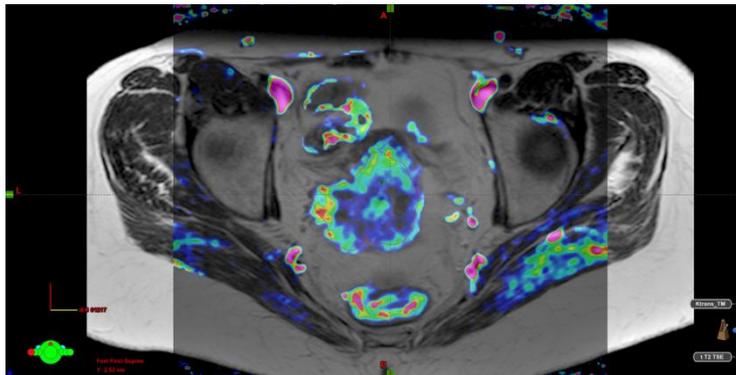
Load and prepare images



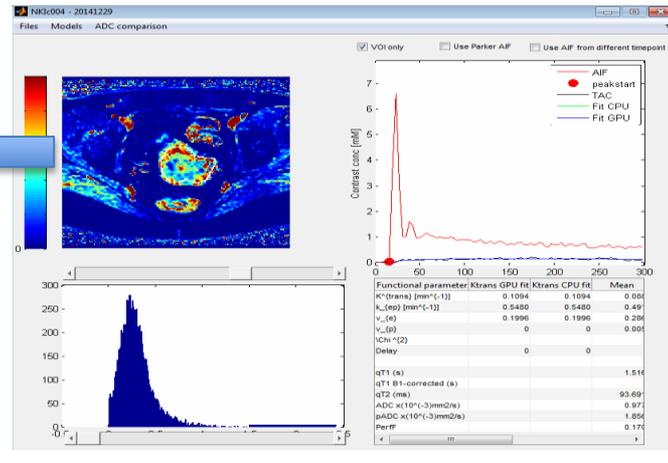
Semi-automatic estimation of AIF



Dicom export into RT software

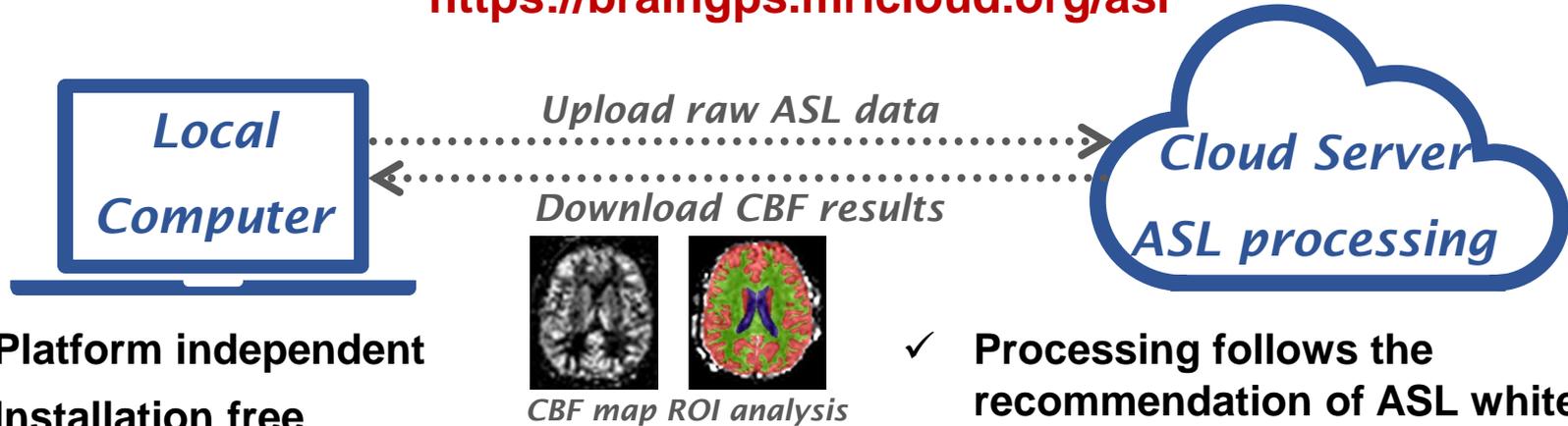


Kinetic modelling



A cloud-computing based tool for arterial-spin-labeling analysis

<https://braingps.mricloud.org/asl>



- ✓ Platform independent
- ✓ Installation free
- ✓ No CPU/memory constraints

- ✓ Processing follows the recommendation of ASL white paper
- ✓ Multi-vendor compatibility
(Philips, GE, Siemens)
- ✓ Varieties of ASL scheme
(pCASL and PASL)
- ✓ ROI analysis (Up to 286 ROIs)
- ✓ Developers perform the maintenance and update (Updates will be archived)



Contact

Yang Li, yang.li@jhu.edu

or

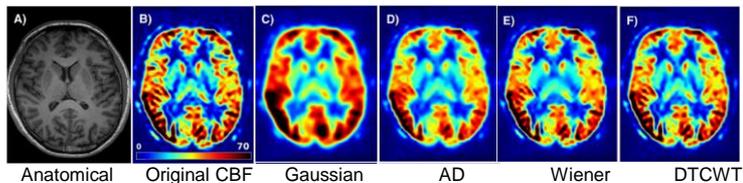
Hanzhang Lu, hanzhang.lu@jhu.edu

(1) MATLAB software for denoising ASL

BRAIN CONNECTIVITY
Volume 5, Number 9, 2015
© Mary Ann Liebert, Inc.
DOI: 10.1089/brain.2014.0290

Voxel-Wise Functional Connectomics Using Arterial Spin Labeling Functional Magnetic Resonance Imaging: The Role of Denoising

Xiaoyun Liang,¹ Alan Connelly,¹⁻³ and Fernando Calamante¹⁻³



The effect of the Gaussian, AD, Wiener and DTCWT denoising methods on SNR and reproducibility measures.

	Original	Gaussian	AD	Wiener	DTCWT
SNR	44 ± 18.9	93 ± 41.16	80 ± 35.8	101 ± 42.8	189 ± 87.2
ICC ⁺	0.86	0.89	0.87	0.86	0.88
wsCV ⁺	6.33%	6.09%	6.26%	6.60%	6.18%

Amir F, Bourgeat P, Liang X, et al., *NeuroImage* 2015

- Simulations: improved accuracy and sensitivity
- In vivo: overall better performance in quantifying CBF
- Demonstrated its role on voxel-wise ASL functional connectomics
- Software: <https://www.nitrc.org/projects/dt-cwt-nlm>

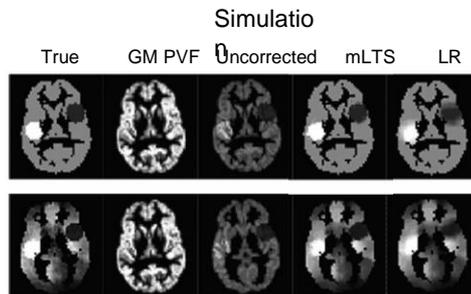
(2) MATLAB Software for correcting partial volume effects in ASL



Magnetic Resonance in Medicine 69:531–537 (2013)

Improved Partial Volume Correction for Single Inversion Time Arterial Spin Labeling Data

Xiaoyun Liang,^{1*} Alan Connelly,^{1,2} and Fernando Calamante^{1,2}



- mLTS: method to correct for partial volume effects in ASL
- Only single TI data required (cf. Chappell et al, MRM 2011)
- Less blurring than method using linear regression (Asllani et al, MRM 2008)
- Separate CBF maps for GM and WM achievable
- Software: https://www.nitrc.org/projects/pvc_mlts/

ASLtbx: ASL signal processing toolbox

<https://cfn.upenn.edu/~zewang/ASLtbx.php>. >3400 downloads since 2009



Main features:

1. Matlab and SPM(5, 8, 12) based scripts (**NEW with GUI now**).
2. ASL specific motion correction.
3. Prior-guided adaptive outlier cleaning (**NEW**).
4. Compatible with PASL, CASL, and pCASL.
5. Sample data with customized scripts.
6. ASL data viewer.
7. A discussion board:

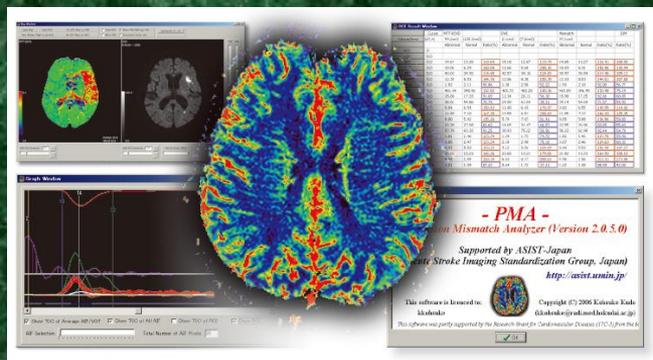
<https://groups.google.com/forum/#!forum/asltbx-discussion-board>

Ze Wang, PhD

redhatw@gmail.com

CCBD, Hangzhou Normal University





CT/MR 灌流画像解析ソフトウェア

PMA

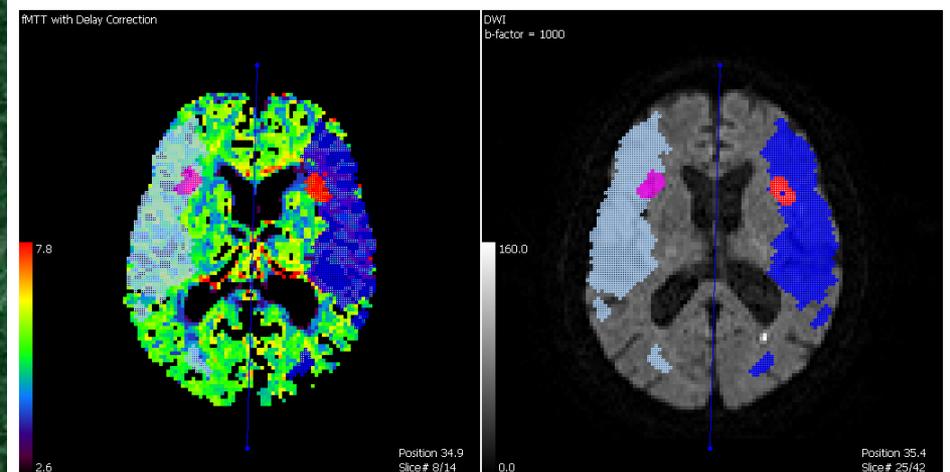
Perfusion Mismatch Analyzer

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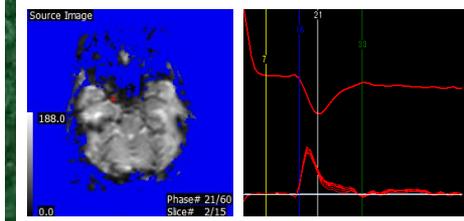


<http://asist.umin.jp/index-e.htm>

Kohsuke Kudo, MD, PhD (kkudo@huhp.hokudai.ac.jp)

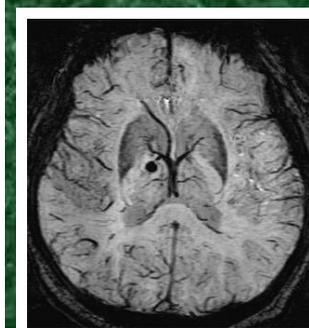


DSC and CT Perfusion (automated analysis)
 Diffusion-Perfusion mismatch (automated ROI)

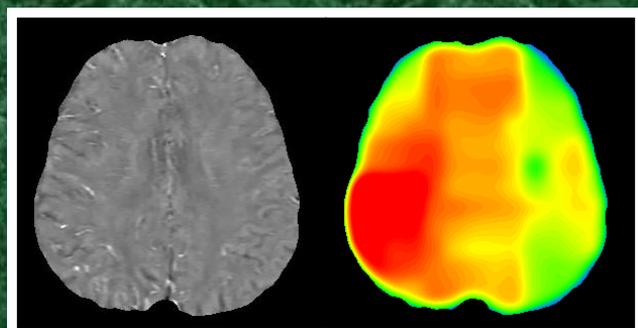


Fully automated analysis

- ✓ Segmentation
- ✓ Bolus detection
- ✓ AIF selection



SWI analysis



QSM based OEF analysis