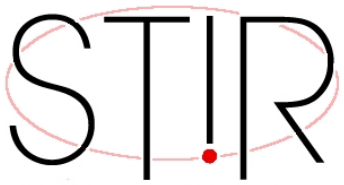

STIR

Software for Tomographic Image Reconstruction

http://stir.sourceforge.net

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STIR objectives

- Software for image reconstruction and data manipulation (STIR 2.4 only PET, STIR 3.0 adds SPECT)
- Research enabler
- Portable to any system with a capable C++ compiler
  - GNU C++, MS Visual Studio, Clang, Intel C++
  - Linux, Windows, MacOS, Solaris, …
- Open Source License: (L)GPL

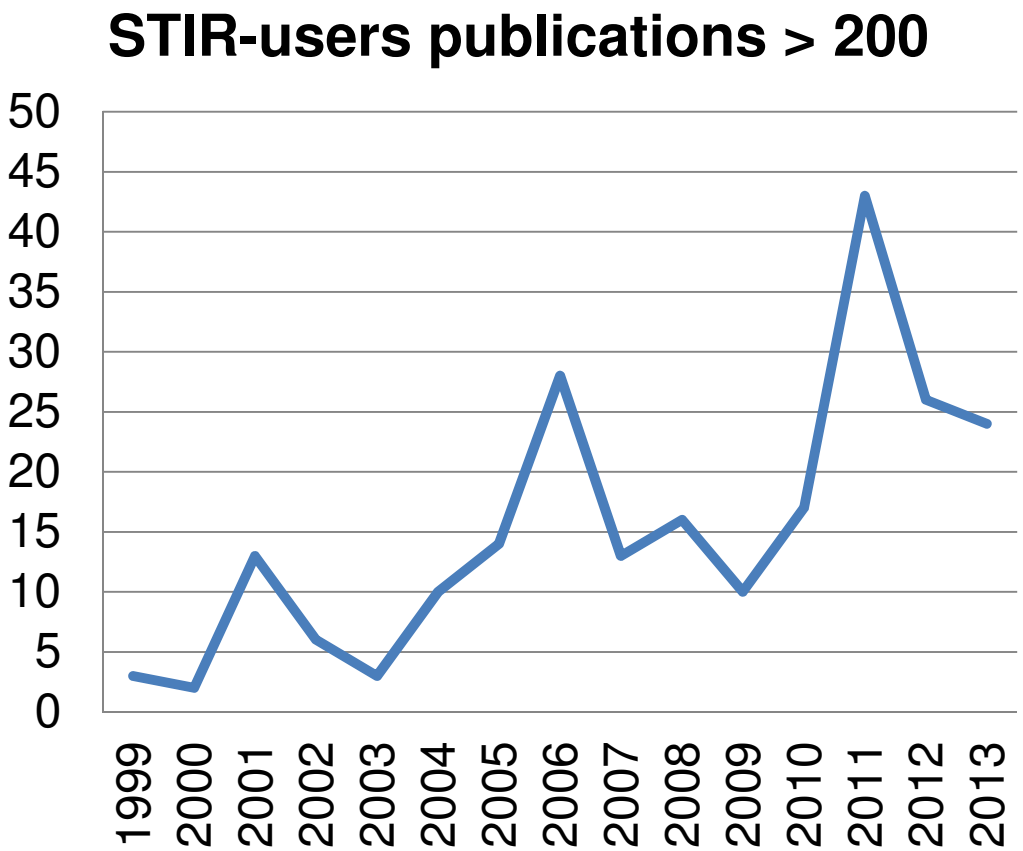
Main Features:

- **Open source library, designed for team-development**
  - Object-oriented (C++), modular, automatic testing
  - Documentation: overview documents; code-specific (doxygen)
- **Capabilities**
  - Analytic and iterative 3D reconstruction algorithms: FBP-3DRP, SSRB, FORE, OSEM, OS-MAP-OSL (including MRP), OSSPS (including QPR), list-mode EM and SPS
  - Parallel processing using MPI
  - Various utilities (e.g. attenuation & scatter correction, image/sinogram data manipulation, ROI parameters estimation, ...)
  - Pharmacokinetic modelling classes for direct parametric reconstruction
  - Data formats: Interfile, ECAT Matrix and partially GE VOLPET

STIR

Active users & developers

- Three open public mailing lists:
  Announcements (217 members),
  Users (292 members),
  Developers (86 members)



Info derived from http://www.citeulike.org
(Group: stir-software)

Recent developments

STIR 2.4 (July 2013)

- Motion correction (Ch. Tsoumpas, KCL)
- STIR from Python (K. Thielemans, ASC)
  - Python is an Open Source scripting language
  - Interface uses SWIG (so extendable to Java, C, …)

STIR 3.0 (November 2013)

- SPECT modelling (B. Martí & C. Falcón, UB)
  - Parallel collimators (and maybe fan-beam)

STIR 3.1 (2014)

- Multi-threading via OPEN-MP (K. Thielemans, UCL)
- … (you!)

STIR

SPECT Reconstruction Library from UB

Generation of transition matrices

- Spatially variant Point Spread Function (PSF) modelling
- Attenuation modelling

Format conversion from SRL-UB to STIR

Reconstruction with STIR (OSMAPOL or OSSPS)

SPECT developments since 2012

- Integration of UB library into STIR
  - Specify projection parameters as usual
  - Image reading/writing via ITK
    - Nifti, MetaIO, NRRD etc
- GUI built using GIMIAS (and ITK)
  - Reads from DICOM sinogram
  - Interactive display of sinograms and reconstructed images

B Marti Fuster, C Falcon, C Tsoumpas, L Livieratos, P Aguiar, A Cot, D Ros, K Thielemans, *Integration of advanced 3D SPECT modeling into the open-source STIR framework*, Medical Physics 40, 092502, 2013.

More information

Main publication:

Thielemans, Tsoumpas, *et al* (2012) STIR: Software for Tomographic Image Reconstruction Release 2, *Physics in Medicine and Biology*, 57(4):867-83.

http://stir.sourceforge.net