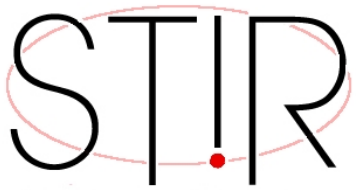

STIR

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

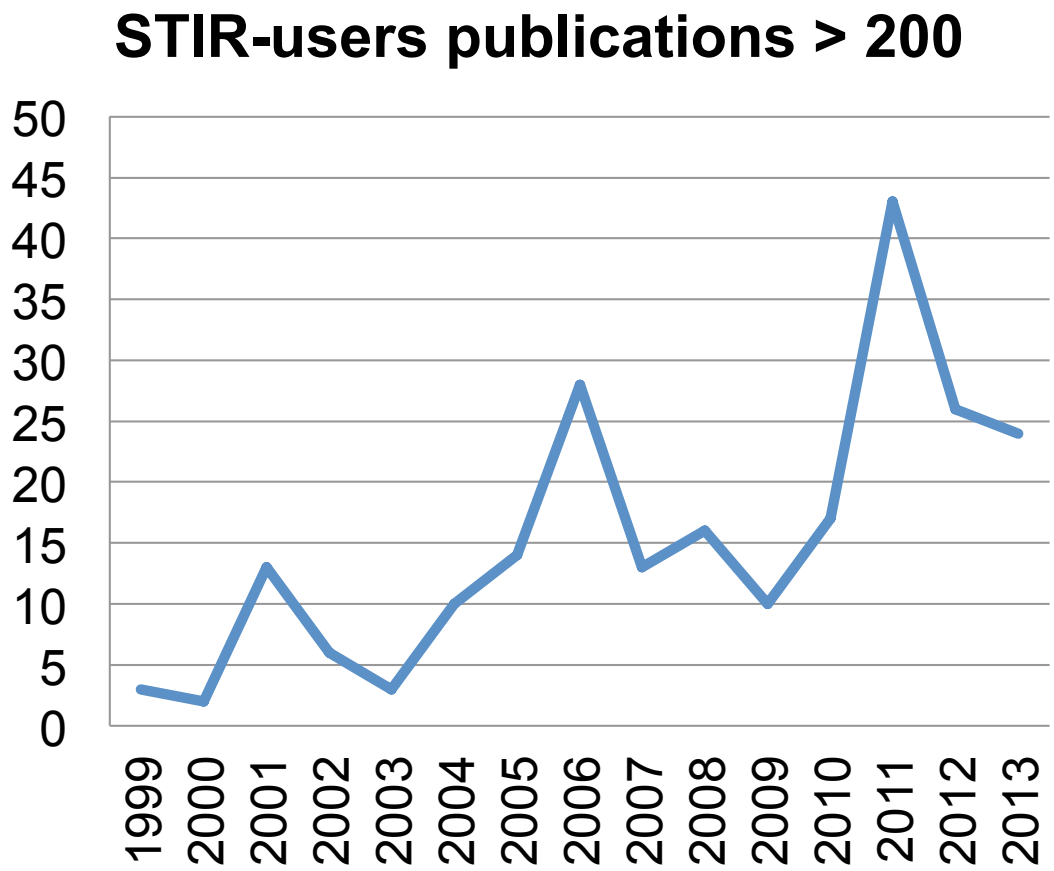
Main Features:

- **Open source library, designed for team-development**
  - Object-oriented (C++), modular, automatic testing
  - Documentation: overview documents; code-specific (doxygen)
- **Capabilities**
  - PET and SPECT
  - 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)

STIR

Developer's perspective

- Object-oriented (C++) and modular
- Documented (doxygen)
- Test framework
- Extendable
  - Mechanism for extending library such that current STIR applications can use your module (e.g. projector) after recompilation
  - Mechanism for writing new applications using (original or extended) library

STIR

Run-time parameter selection

```
OSSPSParameters :=
objective function type:= PoissonLogLikelihoodWithLinearModelForMeanAndProjData
PoissonLogLikelihoodWithLinearModelForMeanAndProjData Parameters:=
  input file := test.hs
  projector pair type := Matrix
      Projector Pair Using Matrix Parameters :=
          Matrix type := Ray Tracing
              Ray tracing matrix parameters :=
              End Ray tracing matrix parameters :=
      End Projector Pair Using Matrix Parameters :=
  Bin Normalisation type := From ProjData
     Bin Normalisation From ProjData :=
          normalisation projdata filename:= norm.hs
     End Bin Normalisation From ProjData:=
  prior type := quadratic
      Quadratic Prior Parameters:=
            penalisation factor := 1
     End Quadratic Prior Parameters:=
end PoissonLogLikelihoodWithLinearModelForMeanAndProjData Parameters:=
initial estimate:= some_image
output filename prefix := test
number of subsets:= 12
number of subiterations:= 24
relaxation parameter := 1
relaxation gamma:=.1
END :=
```

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