This Part

- Software Solutions
- Demo
Open-Source Software

- Provide easy-to-use and efficient implementations of useful learning kernel algorithms.
- Allows end-users to combine standard as well as specialized domain-specific kernels.
- Allow researchers to easily compare against established learning kernel algorithms.
- Allow developers to make use of and extend existing algorithms.
Open-Source Software

Libraries and single algorithms - a starting point:

- **SHOGUN** [http://www.shogun-toolbox.org](http://www.shogun-toolbox.org)
- **OpenKernel.org** [http://www.openkernel.org](http://www.openkernel.org)
- **MKL-SMO, HKL** [http://www.di.ens.fr/~fbach/index.htm#software](http://www.di.ens.fr/~fbach/index.htm#software)
- **SMO q-norm, GMKL** [http://research.microsoft.com/~manik/](http://research.microsoft.com/~manik/)
- **SimpleMKL** [http://asi.insa-rouen.fr/enseignants/~arakotom/code/mklindex.html](http://asi.insa-rouen.fr/enseignants/~arakotom/code/mklindex.html)
- **Mixed-Norm** [http://www.cse.iitb.ac.in/saketh/research.html](http://www.cse.iitb.ac.in/saketh/research.html)
- **DC-program** [http://www.cs.ucl.ac.uk/staff/A.Argyriou/code/dc/](http://www.cs.ucl.ac.uk/staff/A.Argyriou/code/dc/)
- **LP-B, LP-$\beta$** [http://www.vision.ee.ethz.ch/~pgehler/](http://www.vision.ee.ethz.ch/~pgehler/)
www.shogun-toolbox.org
S. Sonnenburg, G. Raetsch, S. Henschel

Large scale kernel methods, focusing on SVM
MATLAB, R, Octave and Python interfaces.
Choice of LibSVM, Liblinear, SVMLight for internal solver.
Standard kernels (e.g. Gaussian) as well as some string kernels (e.g. Locality Improved, Fischer).

L1-combinations, SILP implementation [Sonnenburg et al., 2006]

Lq-combinations (q > 1), specialized interleaved optimization or Newton step wrapper method [Kloft et al., NIPS 2009]
OpenKernel

www.openkernel.org
Cyril Allauzen, Mehryar Mohri, Afshin Rostami

Supports standard kernels, general rational kernels (string kernels) and custom pre-computed kernels.

Interfaces to LibSVM, includes Kernel Ridge Regression implementation.

L1-regularized positive linear combinations

L2-regularized positive linear combinations [Cortes et al., UAI 2009]

L2-positive quadratic combinations [Cortes et al., NIPS 2009]

Two-stage alignment based methods [Cortes et al., ICML 2010]
OpenKernel

- Command-line programs:
  - `klcombinekernels`: combine pre-computed kernels
    - LibSVM or binary format.
  - `klcombinefeatures`: combine explicit feature mappings
    - Supports sparse mappings, millions of features.
  - `klweightfeatures`: weights individual features, i.e. rank-1 kernel combinations
    - Feature weighting/selection.