iLab is:

- Ruby framework for IR experiment.
- You can:
  - retrieve, analyze result, generate report at one-click.
  - work with any search engine.
  - run in parallel using cluster.
Motivation

• IR research involves lots of work
  • Query generation, retrieval, data analysis
  • Scripting helps, not in a graceful way

• Structured approach enables:
  • Automatic, repeatable, scalable IR experiment
  • Knowledge transfer between researchers
When Scripting Fails...

- Code is hardly reused
  - Everything in iLab is object, parameterized, template-based.

- They don’t scale well
  - iLab experiments can be combined to build a more complex one.

- They’re fragile
  - iLab is based on Test-Driven Development.

- They’re hard to debug
  - Ruby provides interactive debugging shell.
  - iLab logs everything for you.

- You have to put efforts
  - Everything is one-click away.
Features

- Object for IR Experiments
  - Document(set), Query(set), SearchEngine
- Models for IR Experiment cycle
  - From design to report generation
- Base Library for IR Metrics
  - MAP, Entropy, KL-Divergence
- Generic Search Engine Interface
- Cluster Integration
Query Execution in iLab

- Query generation
  - Topic file, RegEx pattern (title, desc, narr)
  - Query Template File (QL, DM, ...)

- Search Engine Execution
  - Query Parameter (smoothing, prior)
  - SearchEngine Type (Indri, Lemur, ...)

- Result Evaluation
  - Run trec_eval
  - Run internal evaluation metric function
Working with iLab

Initial Setting
- Global Path

Choose Collection
- Collection Path, Topic, Qrel,

Choose Retrieval Method
- Type(title/desc/narr), Template(QL/DM), Smoothing, Prior, ...

Choose Experiment
- Length Analysis, Query-wise Analysis

Define Report & Run
- Numbers, Chart, Graph, ...
Combining Parameters

**COLLECTION**
- GOV2
- W10G
- TREC3

**RETRIEVAL METHOD**
- title vs. desc. vs. narr.
- Dirichlet vs. Jelinek-Mercer
- QL vs. Dependency Model

**EXPERIMENT**
- Length Analysis
- Query-wise Analysis
- Document-level Analysis
Combining Experiments

3-fold Cross Validation
Architecture
Directory Structure

$exp_root
$work_path

Root
Collection 1
Collection 2
...
Collection N

query
rpt
log

Experiment 1
Experiment 2
Experiment 3
How To Get & Use

• SVN Repository
  • svn+ssh://

• Report Examples

• RDoc Source Document
  • http://www.lifidea.com/doc/ilab

• Start-up & User Guide
  • http://www.lifidea.com/tag/ilab
Future Work

- More search engine interface
- More elaborate cluster interface
  - Using Ruby DRMA API
You can start today!

- Check out iLab source
- Set the parameters & run experiments.
- Create & share new experiments.