

2nd STL Workshop, 23 April 2001

Title:

Status of the CPH STL project

Speaker:

Jyrki Katajainen

Status of Various Headers

`<algorithm>` 47 of 103 functions written as course exercises.

`<deque>` Bjarke has written two versions; a third needed?

`<functional>` Nothing done.

`<iterator>` I have written the declaration.

`<list>` Booked for Jonas, but I have not heard from him.

`<map>` Jacob G. and Asger have written the first version.

`<memory>` Booked for Martin.

`<numeric>` Nothing done.

`<queue>` `queue<>` given in the C++ standard; `priority_queue<>` written by Brian; some more experiments needed.

`<set>` Jacob G. and Asger have written the first version.

<stack> Given in the C++ standard; experiments needed.

<utility> Lars has experimented with pair; rel_ops are trivial.

<vector> Nothing done.

<bitset> Jeppe has written the first version.

<hash_map> Christian and Jacob Chr. have written the first version.

<hash_set> Nothing done.

<optimization> Written by Steffen.

<slist> Henrik has written the first version.

Components Approved by Me

`<optimization>` Author: Steffen Nissen

`find_if` Author: Frederik Rønn

It was more than a month ago I was able to find time to read your programs, but the fact is that most components are still in an experimental state.

Copenhagen STL Reports

2001-1 Jyrki Katajainen and Kimmo E. E. Raatikainen: Instructions to use DIKU style files.

2001-2 Simon Thamdrup Jensen: `random_shuffle()` in the Copenhagen STL

2001-3 Brian S. Jensen: Priority queue and heap functions

2001-4 Bjarke Buur Mortensen: The deque in the Copenhagen STL — First attempt

2001-5 Christian Boesgaard and Jacob Chr. Poulsen: Copenhagen STL — hash map

2001-6 Jacob Gorm Hansen and Asger Kahl Henriksen: The (multi)?(map|set) of the Copenhagen STL

2001-7 Jyrki Katajainen and Bjarke Buur Mortensen: Experiences with the design and implementation of space-efficient deques

2001-8 Philip Bille: A simple implementation of set algorithms for the STL

2001-9 Steffen Nissen: Permutation algorithms in the Copenhagen STL

2001-10 Henrik Skovby: Implementation of a circular singly linked list, slist

2001-11 Jeppe Nejsum Madsen: `bitset<N>` in the Copenhagen STL

Ongoing Work

Lenka Otap: Web-design for the Copenhagen STL. Deadline: 18.5.2001

Martin Starch Sørensen: Fragmentation and SMP-scalability in heap allocators. Deadline: 16.6.2001

Jonas Christian Drewsen: Road map for `cphstl::list` implementation. Delayed.

Jesper Dangaard Brouer and Mads Nielsen: Binary search. No contract written.

Finn Kettner: Associative arrays, part 2. No contract written.

Some Small Jobs

- Script that generates the contributors automatically.
- Script that corrects all doxygen errors.
- Correct DIKU-article.cls into the form I want to see it.
- Correct DIKU-article.bst into a similar form as DIKU.bst.
- Create a header <configure>.
- etc.

Are you searching for a summer job? I am searching for a **performance engineer**. You will get salary for 20 hours and I expect that you work for full time or more.

Possible Written Projects

- `<iterator>` and `<functional>`
- `<space_efficient_vector>`; continue from Bjarke's work.
- In-place merging
- Stable sorting
- Concept checks
- On-line prettyprinting
- pure C compiler/profiler
- Statistics (data mining) on the visits to our Web page.

Or some other project on a component we are still lacking. Note that we have an interesting code database at our disposal.

Possible M.Sc. Projects

- Persistent maps
- Exception safety
- Compiler-time computations
- Testing

What to Teach in Autumn 2001?

- Performance engineering in game industry (proposed by Lars and Tomi)
- M.Sc. seminar
- My favourite software tools

Ongoing Research

- Selection: the strength of iterators as a resource (Jesper Bojesen, Jyrki Katajainen, and Lars Yde)
- Loop unrolling from a compiler to a library (Steffen Nissen)
- Utilizing parallelism for speeding up programs (Jyrki Katajainen and Sofus Mortensen)
- Automating the efficiency comparison of programs (Jyrki Katajainen)
- Methodological issues in algorithm experimentation: a case study of heaps (Jesper Bojesen and Jyrki Katajainen)
- Interchanging two segments of an array in a hierarchical memory system (Jesper Bojesen and Jyrki Katajainen)
- Status of the stable quicksort (Jyrki Katajainen and Jesper Larsson Träff)
- A meticulous analysis of mergesort programs (Jyrki Katajainen, Sofus Mortensen, Maz Spork, and Jesper Larsson Träff)