Show: LLVM in 100 seconds:

https://www.youtube.com/watch?v=BT2Cv-Tjq7Q&t=2s$G

CSE110A: Extra Credit Ideas

CSE110A: Introduction to Compiler Design

Maximum Extra Credit: Doing HWK5 - it can be done in addition to the other extra credits below.

Additional Extra Credit: Doing a minimum of 3 pages summary about any of the videos or topic write-ups below. You can use ChatGPT, but you need to include the questions and answer, and at least one paragraph of how you used it and why.

Additional Extra Credit: Giving a 5 minute talk on the last day of class about your topic.

The grading details of the extra credit, are still being worked out. At present think of this as an additiomal experience.

The topics below are suggestions. A good source of interesting topics about compilers is the LLVM Channel in YouTube. In a way the farther back you go, the less esoteric the topics are. LLVM IR, MLIR, and tool chain related to LLVM are all great topics. Topics related to Flex,Lex,Yacc,Bison, etc.

You can also do something interesting in the LLVM pipeline. e.g. something cutting edge provocative that could stimulate future work for yourself and others. e.g. suggest a novel idea. You can do this yourself and/or colaborate with a 2nd person.

Possible things to cover:

- Make a critique of the video, from a learning perspective

- Interesting aspects of what you saw.

- Mini-tutorial of what you learned.

- Review of novelty of ideas you saw.

- Potential for future research.

- Reccommendations.

- Make it interesting to yourself and others.

Publications and Tutorials

A Gentle Introduction to LLVM IR:
Website with a tutorial
https://mcyoung.xyz/2023/08/01/llvm-ir/

SITE: LLVM

2024 EuroLLVM - Teaching MLIR concepts to undergraduate students
5.2K views • 11 months ago 19:01
2019 EuroLLVM Developers' Meeting: V. Bridgers & F. Piovezan LLVM IR
Tutorial - Phis, GEPs . . . "
29K views • 6 years ago 50:46
2017 EuroLLVM Developers' Meeting: D. Majnemer "XLA: Accelerated Linear
Algebra"
5.4K views • 8 years ago 36:41
2024 EuroLLVM - MLIR Linalg Op Fusion - Theory & Practice
1.5K views • 11 months ago 21:13
2019 LLVM Developers' Meeting: A. Warzynski "Writing an LLVM Pass: 101"
16K views • 5 years ago 1:09:15
2017 LLVM Developers' Meeting: M. Braun "Welcome to the back-end: The
LLVM machine representation"
9.8K views • 7 years ago 53:56
2020 LLVM in HPC Workshop: Keynote: MLIR: an Agile Infrastructure for
Building a Compiler Ecosystem
9.6K views • 4 years ago 1:04:43

SITE: LLVM Social Bangalore

Deep Learning Based Compiler Optimizations
1.9K views • 3 years ago 1:42:38
Introduction to Compilers and Stages of Compilation
3.1K views • 2 years ago 1:11:37
Torch-MLIR 101
3K views • 2 years ago 45:00

SITE: Triton

Mosaic GPU: A DSL for Fast Hopper Kernels in Python
801 views • 8 months ago 15:59
Compiler Tools: Writing an MLIR Pass
2K views • 8 months ago 31:51

SITE: TensorFlow

Inside TensorFlow: AutoGraph
10K views • 5 years ago, 53:55
Inside TensorFlow: TF Model Optimization Toolkit (Quantization and Pruning)
16K views • 5 years ago 42:35
Inside TensorFlow: MLIR for TF developers
10K views • 5 years ago 43:41

TOPIC: SPARSE TENSORS AND COMPILERS

[CTSTA'23] Challenges and Opportunities for Sparse Compilers in LLM
19 views • 10 months ago 16:27
ACM SIGPLAN
ICPP Keynote: Making Sparse Fast with the TACO Domain Specific Language
for Sparse Tensor Algebra
194 views • 4 years ago 30:12
Saman Amarasinghe
AMD HIP Tutorial, 9-3, rocSPARSE
117 views • 1 year ago 13:54
Yifan&GPU
[SPARSE24] Design DSLs with xDSL
240 views • 10 months ago 21:33
ACM SIGPLAN

MISCELLANEOUS SITES:

How to build a compiler with LLVM and MLIR - 09 IR (SLIR) generation
2.6K views • 3 years ago 1:04:45
lxsameer
Read a paper: Multi-level Intermediate Representation (MLIR)
6.9K views • 3 years ago 7:42
Vivek Haldar
Who uses JAX?
10K views • 2 years ago 3:31
Google Research
Building domain-specific compilers quickly with MLIR compiler infrastructure |
Chris Lattner
16K views • 4 years ago 4:30
Lex Clips
HC34-T2: Heterogeneous Compilation in MLIR
5.5K views • 2 years ago 3:32:32

hotchipsvideos
Writing a compiler with LLVM - Cailin Smith - NDC Oslo 2022
48K views • 2 years ago 47:58
NDC Conferences

What's New in Compiler Explorer? by Matt Godbolt
https://www.youtube.com/watch?v=Ey0H79z_pco&t=6s
2.3K views 1 year ago #cpp #cppprogramming #compiler
https://www.cppnorth.ca

An introduction to LLVM IR
https://www.youtube.com/watch?v=CDKuH7SIgdM&t=614s
2.2K views 3 months ago 33:55