

# Introduction to LLVM

UG3 Compiling Techniques

Aaron Smith

# About Me

- Call me Aaron
  - Originally from Texas and now in Seattle
- Working on compilers in industry and academia for 20 years
  - Manage a compiler and computer architecture group at Microsoft Research
  - Visiting Professor at UEdi for the last two years
- Studied at the University of Texas at Austin
  - Bachelors, Masters, PhD in Computer Science
  - Go Horns! 😊

# Schedule

- Week 1
  - Nov 15: Overview
  - Nov 18: Introduction to LLVM
  - [LAB: How to use LLVM on DICE](#)
- Week 2
  - Nov 22: LLVM Bitcode and Internals Part I
  - Nov 25: LLVM Bitcode and Internals Part II
  - [LAB: Writing an LLVM Pass](#)
- Week 3
  - Nov 29: Static Analysis, JIT'ers, Javascript, Security
  - Dec 2: Compiler Trivia!!
  - [LAB: Work on Final Project](#)

# Project Overview

- LLVM is written in C++
  - But no templates or tricky C++ code
  - If you know C or Java you will be OKAY
- LLVM sources are hosted in both SVN and Git
  - You can use either but we will only discuss Git in the course
  - You need to submit the final project to Github
- Project will be graded on Linux
  - LLVM works on OSX and Windows but we will only grade on Linux
  - If you work on other platforms make sure it also works on Linux!
- **Final project is due by Monday, January 16, 2017 at 10am**

# Contact Information

- Office: IF 2.22
- Email: [aaron.lee.smith@gmail.com](mailto:aaron.lee.smith@gmail.com)
- Office Hours:
  - Tuesday from 11-12pm
  - Anytime by appointment (i.e. send me an email)

# Getting Started

- Read the original LLVM paper (optional)
  - LLVM: A Compilation Framework for Lifelong Program Analysis & Transformation, Chris Lattner and Vikram Adve, CGO 2004
  - <http://dl.acm.org/citation.cfm?id=977673>
- Read the Dr Dobbs article on LLVM (optional)
  - The Design of LLVM, Chris Lattner 2012
  - <http://www.drdobbs.com/architecture-and-design/the-design-of-llvm/240001128>
- Look at LLVM.org