Feldspar Overview

The Feldspar Team

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RawFP meeting 2011-05-20

Challenges for the telecom industry

The telecom industry is currently experiencing some interesting challenges

- Dramatic increases in bandwidth and computational needs
- Increasing need to deliver new services faster
- Architectural shift to manycore, heterogeneous chips

Current telecom developments standards

Currently telecom software is written using low level C code with hardware specific intrinsics, heavily optimized for one particular target.
This has a number of drawbacks

- The development is error-prone
- Causes significant lead-times
- Code has limited portability

Signal processing (DSP) is the central and most critical domain for this code

Goals for Feldspar

Feldspar: Functional Embedded Language for Digital Signal Processing and Parallelism

- Aims at raising the abstraction level for the embedded programmer
- Generate efficient code for embedded targets
- Support parallelism and deployment on manycore architectures
- Provide a transparent cost model

Feldspar Design

A birds eye view of the design of Feldspar

- A functional language
- Currently focuses on dataflow style programming
- Sizes are inferred at compiletime
- Stratified in a high level language and a core language

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- Embedded in Haskell, a general purpose functional language
- Effectively implemented as a library in Haskell
- Parser and typechecker for free

Feldspar Architecture

An overview of the architecture of Feldspar