



CO-DFNS IN 2018: WHAT'S NEW?

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Trials and Tribulations of a Ph.D.

Old Features

Primitives

Dfns

GPU

Graphics Display

Caching

FFT

Multi-platform

Non-APL Integration

Numeric Data types

New Features?

Bracket Indexing

Simplified Installation

Named Namespaces

Improved Primitive Support

Matrix Divide

Matrix Inverse

Complex Number Support*

Parsing!

Ambiguous Parse Trees

User-defined Operators

Indexed Assignment

Bracket Indexing

Code Cleanup

Shakedown Time

AGPL v. Closed License

Low-level AngularFire Logging

User Command!

Build Path is CWD

Compiler Auto-detection

Automatic Backend

Plot Performance

Dependency Runtime Loading

GCC Compatibility

Duplicate Bindings

Binomial and other Primitives

Empty dfns

Lexical Bindings

Fast Code

Dynamic

$\{X \leftarrow 5 \ \diamond \ X\} \theta$

5

$\{X \leftarrow 5 \ \diamond \ X\} \theta$

$\{X \leftarrow 5 \ \diamond \ Y \leftarrow X + X \ \diamond \ X \leftarrow 6 \ \diamond \ Y + X\} \theta$

$\{X \leftarrow 5 \ \diamond \ Y \leftarrow X + X \ \diamond \ X \leftarrow 6 \ \diamond \ Y + X\} \theta$

16

$\{X \leftarrow 5 \diamond f \leftarrow 2 \circ x \ddot{*} X \diamond X \leftarrow 4 + \imath \omega \diamond f X\} 5$

{X ← 5 ◊ f ← 2 ◊ x * X ◊ X ← 4 + 2ω ◊ f X}5

128 160 192 224 256

$\{X \leftarrow 5 \ \diamond \ f \leftarrow \{\alpha + X + \omega\} \ \diamond \ g \leftarrow X \circ f \ \diamond \ X \leftarrow 4 \ \diamond \ g \ 3\} \theta$

$\{X \leftarrow 5 \ \diamond \ f \leftarrow \{\alpha + X + \omega\} \ \diamond \ g \leftarrow X \circ f \ \diamond \ X \leftarrow 4 \ \diamond \ g \ 3\} \theta$

12

$\{X \leftarrow 5 \ \diamond \ f \leftarrow \{Y \leftarrow X+X \ \diamond \ X \leftarrow 3 \ \diamond \ Y \times X\} \ \diamond \ f \ \omega\} \theta$

$\{X \leftarrow 5 \ \diamond \ f \leftarrow \{Y \leftarrow X+X \ \diamond \ X \leftarrow 3 \ \diamond \ Y \times X\} \ \diamond \ f \ \omega\} \theta$

30

$\{X \leftarrow 5 \diamond 0 \leftarrow \{\alpha \times Y \times \omega\} \diamond f \leftarrow X \circ \{Y \leftarrow 3 \diamond X \ 0 \ \omega\} \diamond f \ \omega + 7 \rightarrow X \leftarrow Y \leftarrow 1\} 10$

17

$\{X \leftarrow 5 \diamond 0 \leftarrow \{\alpha \times Y \times \omega\} \diamond f \leftarrow X \circ \{Y \leftarrow 3 \diamond X \ 0 \ \omega\} \diamond f \ \omega + 7 \rightarrow X \leftarrow Y \leftarrow 1\} 10$

Novel Solution

Preserves Single-assignment Goodies

Avoids complex algorithms

Mantis17 Approved

More reliable recursion

Better Global Variables

Exported Globals

Less Overhead

Better Asymptotic/Constants

More Feedback while Compiling

Infrastructure for 1st Class Procs

Prep for Sparse Matrices

User-defined Operators Near

Bug Fixes

Multiple Namespaces

Easier to Read/Maintain

Tree Pretty-printer (pp3)

Smaller, Corrector, Betterer

40 vs. 90 LoC

Linear Memory
Log-linear Time
Log Critical Path

Tree Talk, Thursday

Thank You.