State of the Lisp Family

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- All about me
- A very very brief history
- Why care about lisp?

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- Implementations
- Features
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- Projects
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- Brief History
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- I do NOT use lisp at work. I write ruby (on rails) and javascript
- I have only been part of the lisp community for a couple years
- I am most experienced with Common Lisp, Emacs Lisp, and Clojure
- I have played with Guile briefly
- I have a blog at azrazalea.net and git repositories on gitlab
- This presentation is on gitlab at `https://gitlab.com/azrazalea/state-of-lisp-family`
- Lisp(NOT common lisp) was first specified in 1958
- Many many dialects of Lisp have appeared over the years. See wikipedia
- The general hallmark of a Lisp is its s-expression based syntax (equal '(Lisp) '(Lots of Insipid, Stupid Parentheses))

- Originally heavily used in academic circles and AI
- Now mostly limited to small communities (Yes Clojure is still small)
- First and foremost lisp is FUN
- Lack of syntax and s-expressions are very freeing once you get used to them (and have a good editor)
- A very smart community that can unfortunately sometimes be hard to get into
- Code as data is awesome

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- Work started in 1981, draft published 1984, 2nd draft 1990, final standard 1994
- Standard was a compromise/design by committee between the authors of various lisp implementations
- Standard came out of Interlisp, Maclisp, and others
- The language itself has not changed since this standard was published
- Language improvements done as implementation specific extensions
- Many things can be implemented as macros/reader-macros and shipped as libraries
- Quicklisp (a library manager) released in October 2010
- Roswell lisp implementation manager and script framework released very recently (not sure on date)

- There are many different implementations of the CL standard
- Commercial: Allegro CL, LispWorks

- Open Source: ABCL, Clasp, Clozure CL, CLISP, CMUCL, ECL, MKCL, SBCL and more
- Popular free ones are SBCL and CCL(Clozure CL). Both fast and cross platform

- CLOS (Common Lisp Object System)
- Pretty much every standard data structure
- Optional tail call optimization
- Robust package (think namespaces) system
- Build manager (asdf)
- Library manager (quicklisp)
- Fast with the right implementation

- Old and crotchety (community and language)
- Sometimes large differences between implementations (usually patched over with a cross-implementation library)
- Some simple things baked into most modern languages are implementation specific (threads, garbage collection, FFI, Networking stuff, OS stuff)

- Pretty much everything new on my gitlab
- Mcclim
  https://github.com/robert-strandh/McCLIM cross platform GUI/Windowing library
- Cluffer text editor buffer
  https://github.com/robert-strandh/Cluffer
- Climacs emacs replacement https://github.com/robert-strandh/Second-Climacs
- Lots of game programming libraries at
  https://github.com/lispgames
- See http://eudoxia.me/article/common-lisp-sotu-2015
  "State of the Common Lisp Ecosystem, 2015"
- Libraries for almost everything you'll want to do
- Used at grammarly https://www.grammarly.com/
  http://tech.grammarly.com/blog/posts/Running-Lisp-in-Production.html

- Open source Evernote alternative `https://turtl.it/`. Server is in Common Lisp
- Commercial examples at `http://franz.com/success/` and `http://www.lispworks.com/success-stories/index.html`
- There seems to actually be quite a bit of it, just not advertised and generally closed source.
- See `https://lispjobs.wordpress.com/`

1. Purpose
   - "Seamless" integration with C++ using LLVM.
   - Speed and power of existing C++ code combined with the rapid prototyping, incremental dev, and other common lisp advantages.
2. Projects
   - Mostly academic use so far.
   - Read creator's blog here: `https://drmeister.wordpress.com/`

- Creator is implementing CANDO, a tool for biologists for molecular design
- I don't know of any production use cases yet, but it is pretty cool!

1. Purpose
   - Supports many platforms (Linux, FreeBSD, NetBSD, OpenBSD, OS X, Solaris, Windows on Intel, Sparc, Alpha, PowerPC, and Arm)
   - Extremely portable with small and fast binaries.
   - Can be called like a C library with no FFI
   - Can call C functions with no FFI
2. Projects
   - ECL on Android with libsdl for game programming `https://gitlab.com/dto/ecl-android-games-src`
   - Various people working on general purpose projects. ECL is a full common lisp
   - See `https://common-lisp.net/project/ecl/`

- Practical Common Lisp
  `http://gigamonkeys.com/book/`
- Common Lisp Recipes (for after PCL)
  `http://weitz.de/cl-recipes/`
- Land of Lisp (fun alternative to PCL [love the comics])
  `http://landoflisp.com/`
- Common lisp hyperspec `http://www.lispworks.com/documentation/HyperSpec/Front/index.htm`
- Duckduckgo hyperspec search with !clhs
- Articulate Common Lisp `http://articulate-lisp.com`
- `http://lisp-lang.org/`
- #lisp and #lispgames on freenode IRC
- For the love of lisp, use Emacs + SLIME(or the newer sly) as your REPL even if not your editor

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- Created by Rich Hickey
- Original public release 2007-10-16
- First stable release (1.0) 2009-05-04
- Latest version 1.8

- Java, the original and most supported
- Javascript, (clojurescript) official and run by David Nolen
- Various others in various states of support

- See `http://clojure.org/about/rationale`
- Basically wanted A lisp for functional programming symbiotic with Java and designed for concurrency.

- Immutability focused
- Very good java/javascript interop
- All the bells and whistles you'd expect with a modern language

- Functional programming "only" (I consider this an anti-feature personally)

- Can you think of it? Someone has probably done it in Clojure
- Heavily used for backend web services so far
- Climate Corporation (our location sponsor) is a heavy user for production
- Walmart, Puppet Labs, Thoughtworks are some big companies using Clojure
- Lot of the cool stuff is in Clojurescript land like Om and Reagent

- Clojure for the Brave and True `http://www.braveclojure.com/`
- Cursive + IntelliJ IDE `https://cursive-ide.com/`
- Emacs + Cider IDE `https://github.com/clojure-emacs/cider`

- Clojurescript info
  `https://github.com/clojure/clojurescript/wiki`

- #clojure on freenode IRC

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- Originally PLT Scheme
- First appeared in 1994
- Renamed Racket 2010-06-07

- Lots and lots of friendly libraries and documentation
- Ships with IDE Dr. Racket
- Lots of learning/teaching resources, especially for kids
- Designed to be very easy to get up and running and make simple programs
- General purpose, does not force you into a particular paradigm
- Scribble documentation language

- Naughty Dog uses Racket in Uncharted, The Last of Us, etc
- Racket controls a huge telescope in New Mexico
- Arc (see later slides) implemented in Racket

- John Carmack using Racket for Gear VR. `https://groups.google.com/d/msg/racket-users/RFlh0o6l3Ls/8InN7uz-Mv4J`
- Watch the Racketcon videos or go to Racketcon for more information!
- Racketcon is right after the STL Strangeloop Conference!
- Cool game creating book `http://realmofracket.com/`
- Awesome official docs `https://docs.racket-lang.org/`
- #racket on freenode IRC

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- Began work in 1993
- Originally GEL or GNU Extension Language
- Designed as a spiritual and cleaner successor to Emacs lisp
- Development languished until Andy Wingo took over in 2009/2010
- Guile 2.0 in 2011 revitalized the language with many improvements
- Since 2.0 there have been many incremental improvements to the language

- Very embed-able, designed for a polyglot environment
- Full featured, lots of batteries included libraries
- Easy to use C API that goes both ways
- Support for writing in other languages that compile to Guile including ecmascript, emacs lisp, and WIP for lua
- General purpose

- Mostly GNU projects as it is the official GNU extension language
- Project in progress to replace Emacs Lisp with guile, but community is split
- GNU Guix & GuixSD (cool nix-like package manager and distribution)
- GnuCash
- gEDA
- GDB
- Artanis web framework (pretty new)
  `http://web-artanis.com/`
- Sly game programming framework
  `https://dthompson.us/pages/software/sly.html`
- Official tutorial `https://www.gnu.org/software/guile/docs/guile-tut/tutorial.html`
- Manual
  `https://www.gnu.org/software/guile/manual/`

- List of resources
  `https://www.gnu.org/software/guile/learn/`

- #guile on freenode IRC

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- Practical and portable
- Wants to bring Scheme out of the academic world and into the industry
- Focus on being simple, fast, and easy to learn

- Compiles to standard C using the GNU toolchain
- Runs on x86, x86-64, ARM, MIPS, Sparc64, PowerPC, and more
- Well documented in the wiki and manual
- Plenty of libraries and a library manager
- Good FFI

- Tehila game engine
  `https://wiki.call-cc.org/tehila`
- Wiki software qwiki
  `https://wiki.call-cc.org/egg/qwiki`
- Really just see `https://wiki.call-cc.org/Software`

- Excellent official wiki `https://wiki.call-cc.org/`
- Official manual `http://wiki.call-cc.org/man/4/The%20User's%20Manual`
- #chicken on freenode IRC

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- First appeared in 1985
- Based off Maclisp (a now dead lisp dialect)
- Has gradually gained more and more features over the years but no major revisions really
- Considered outdated compared to modern Scheme or Common Lisp
- Some in GNU want to replace with Guile

- Pretty much just for emacs
- Allows easier extensibility than C (which the rest of emacs is written in)
- Definitely NOT designed for general purpose programming

- Emacs of course
- Any of the hundreds (thousands?) of emacs packages
- Org mode (this presentation is Org Mode -> Latex + Beamer -> PDF)

- Web servers
- Games
- API glue
- All kinds of fancy IDE features

- Emacs Lisp Intro (C-h i and look for 'Emacs Lisp Intro' in emacs) `https://www.gnu.org/software/emacs/manual/html_node/eintr/index.html`
- Emacs Lisp Reference (C-h i and look for 'Elisp' in emacs) `https://www.gnu.org/software/emacs/manual/html_node/elisp/index.html`
- Learn emacs lisp in the Wiki `https://www.emacswiki.org/emacs/LearnEmacsLisp`
- The emacs wiki `https://www.emacswiki.org/emacs/LearnEmacsLisp`
- #emacs in freenode IRC

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- First appeared in 1988 for the Apple Macintosh
- Simplicity and minimalism
- Single internal data type (cell)
- Numbers, symbols, and lists are the ONLY built in data types
- Differs from other lisps in not having lambda, but does not require it
- Integrated database
- "Awesome" C/Java interop

- Official documentation `http://picolisp.com/wiki/?Documentation`
- #picolisp on freenode IRC

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- Originally called Qi
- Static types
- Optional laziness
- integrated prolog
- Macros
- Portability
- Runs on top of various languages including SBCL Common Lisp, Clojure, Scheme, Ruby, Python, JVM, Haskell, Javascript.
- Free learning resources are lacking

- Official wiki `https://github.com/Shen-Language/wiki/wiki`
- Two official books desribed at `http://shenlanguage.org/`
- #shen on freenode IRC

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- Written by Paul Graham starting in 2001
- Written in Racket Scheme
- See essay `http://www.paulgraham.com/popular.html`
- Released in 2008
- Designed to be simple
- Seems to have a very small community
- Hackernews (news.ycombinator.com) is implemented in Arc

- Seems to only have `http://www.arclanguage.org/tut.txt`

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- Written by Robert Virding
- Work begin in 2007
- Basically developed just because the author wanted to develop a language on top of erlang and likes lisp
- Author was one of the creators of Erlang
- Provides erlang with meta programming and a feature rich REPL
- `http://lfe.io/`

- Also called Hylang
- Written by Paul Tagliamonte
- Introduced at PyCon 2013
- Transparent Lisp front end to Python
- Extreme python interop, since it is basically python
- `http://docs.hylang.org/en/latest/#`

- Heavily inspired by Clojure

- Written by Timothy Baldrige
- Our own Chris Gore has contributed
- First appeared in 2015
- Implemented in RPython and uses PyPy Garbage Collector and tracing JIT
- Basically a clojure dialect with fast startup and native code
- Very young, good for small scripts/programs
- `http://pixielang.org/`

- Scheme on the JVM
- Many consider it to have better Java integration than Clojure or ABCL
- See `https://www.gnu.org/software/kawa/` and `http://lwn.net/Articles/623349/`