tempuhs:
Technical overview

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tempuhs:
Technical overview

エレベーターの中は真っ暗だ

tempuhs:
Technical overview

➔ tempuhs is a chronicler

➔ This means that it orders events by time

➔ Tell tempuhs when stuff started to occur and when it stopped occurring, and it will order stuff for you

➔ OK, sounds like a calendar, what's the point?

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➔ Well, simply by automating the actual ordering, tempuhs is already better than a <u>calendar</u>

➔ We'd like to think we have more RAM than most calendars too, so tempuhs can store <u>a lot</u> of stuff

➔ Copying (& therefore sharing) is arguably simpler...

➔ But surely any tech > a calendar – what's tempuhs going to do better than <u>any other</u> tech?

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tempuhs:
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➔ Being infinitely and infinitesimally precise

➔ Gracefully converting between infinite and infinitesimal precision

➔ Gracefully presenting infinite and infinitesimal precision and allowing navigation between them

➔ tempuhs is free software that anyone can research and use for anything they want!

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➜ OK, that's pretty cool, what else?

➜ Well, imagine something as powerful as Wikipedia or OpenStreetMap, but with time visualisation

➜ And contextual visualisation at that – "history is just an agreed upon set of lies" – tempuhs will let you jump between realities!

➜ Also, how about concert tips and job offers?

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➔ Wow! I'm convinced! Sign me up!

➔ Yeah, about that

➔ Per now tempuhs is mostly a glorified calendar that automates the hard stuff

➔ But we have ideas and even some implementation in place for all of the cool stuff we just mentioned

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Architecture

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➜ Two main parts: tempuhs and tempuhs-server

➜ tempuhs has the database with all data representation, and some data transformations for converting between time

➜ tempuhs-server is the tempuhs interface – it presents a documented RESTful API for communicating with tempuhs

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tempuhs: the whirlwind tour

➔ Timespans (with attributes)

➔ Users (with attributes)

➔ Roles (kind of like UNIX groups)

➔ Permissions (own-read-write)

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tempuhs-server: overall picture

→ The scotty application that sets up requests is found in the Tempuhs.Server module – it's banal

→ Tempuhs.Requests sets up all the request handlers, which are implemented in Tempuhs.Requests.*

→ test and prop have unit and property tests respectively

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tempuhs-server: our workflow

➔ Write documentation (/doc) for what is needed

➔ Write unit tests (/test) for how it should work

➔ (If applicable: Write laws & properties (/prop) to guarantee that it works correctly)

➔ Write the necessary morphisms (/src) for it to work

➔ Write the actual code (/src) that makes it work

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Major libraries
→ Scotty

tempuhs:
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➔ **RESTful declarative Web applications**

➔ **Really simple**

➔ **Really fast**

➔ **Uses WAI (application interface) and Warp (Web server)**

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Major libraries

➔ Persistent

tempuhs:
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➔ Datastore (ORM)

➔ Type-safe

➔ Data serialization

➔ Backend-agnostic "enough" (we use SQLite for tests & PostgreSql for the real deal)

➔ Developed for Yesod, so very active

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Major libraries
➔ Esqueleto

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➔ Persistent does not offer any way to do joins

➔ Esqueleto gives us type-safe joins and easy-to-write SQL queries

➔ We are looking at using Opaleye instead, which gives us compilitime errors on ill-formed SQL queries – very cool in theory, deserves to be thoroughly explored

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Major libraries
➔ Hspec

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➔ Unit tests

➔ Frontend engineers make some really silly requests sometimes — we need to make sure we catch the worst of them

➔ It also gives us a really nice way to specify how our functions should work, before actually writing them

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Major libraries

➔ Quickcheck

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➔ **Property testing**

➔ **Some of the stuff tempuhs does is rather complicated**

➔ **To make sure it is also correct, we formulate laws and test them**

➔ **QuickCheck is black magic**

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➔ **https://secure.plaimi.net/works/tempuhs.html**

➔ **https://github.com/plaimi/tempuhs**

➔ **https://github.com/plaimi/tempuhs-server**

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