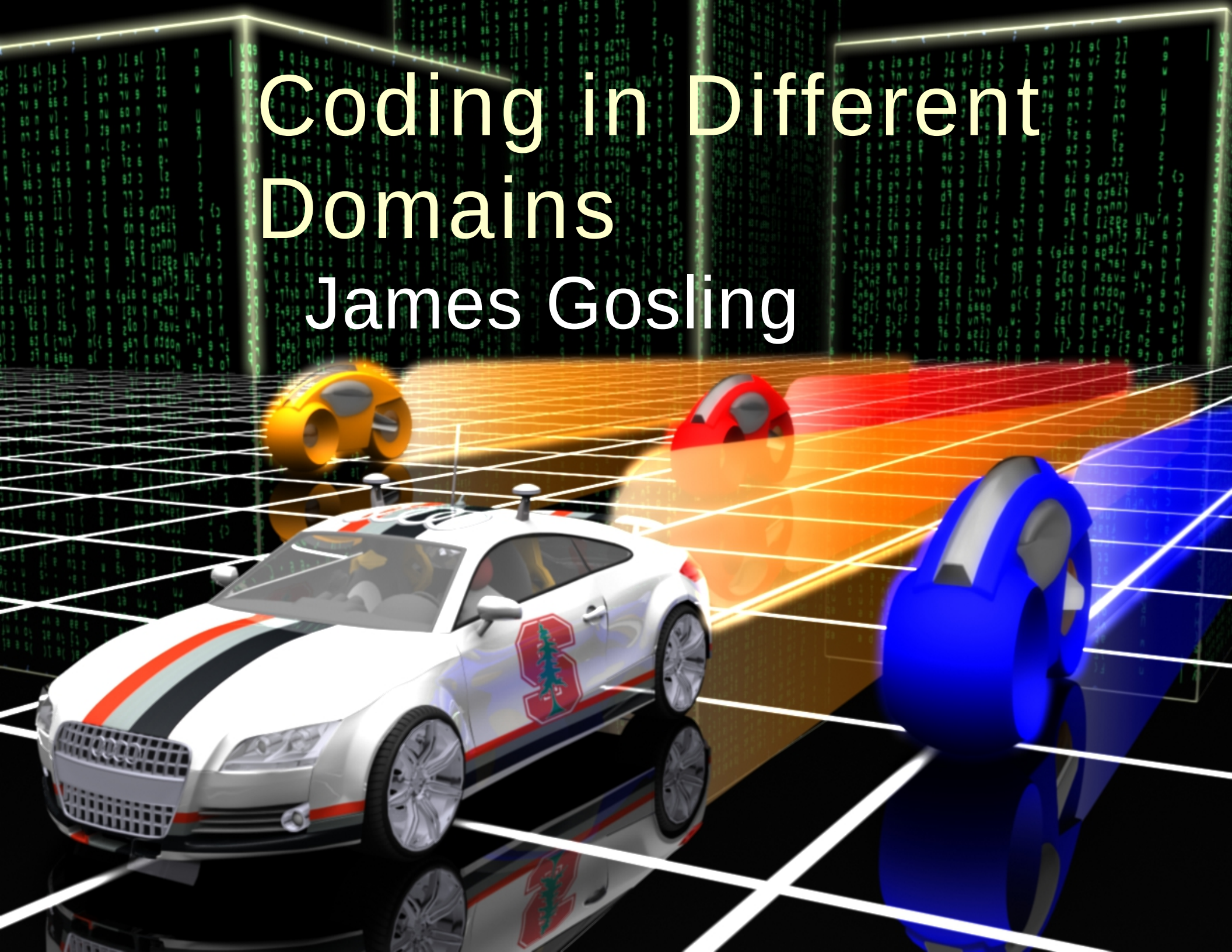
# Coding in Different Domains

James Gosling



Or:
Datamining the Brains of Mechanical Engineers

Or:
What I've been doing during my (extended) summer vacation.

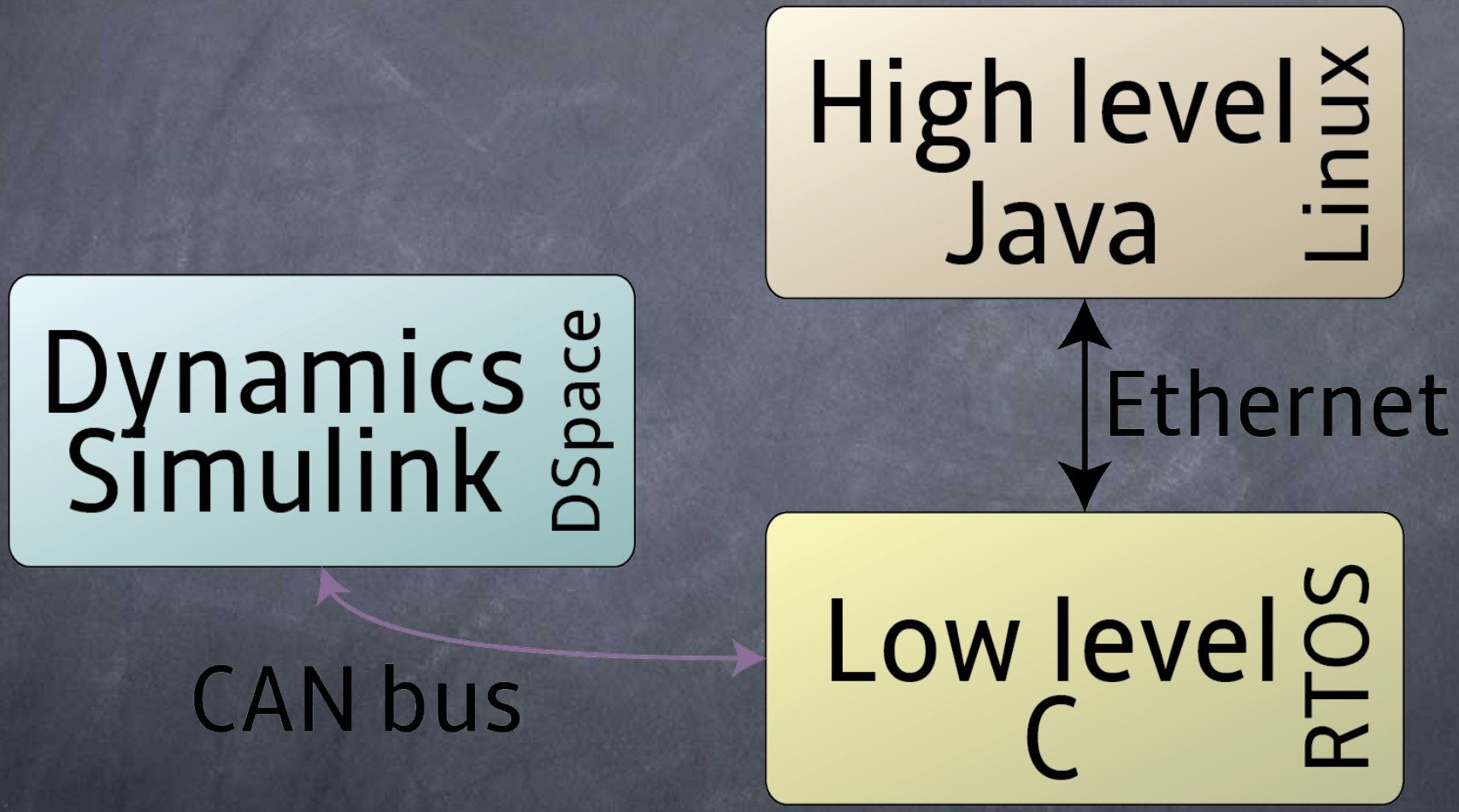
# Mostly Rambling

# Genesis: joint VW, Stanford & Sun project

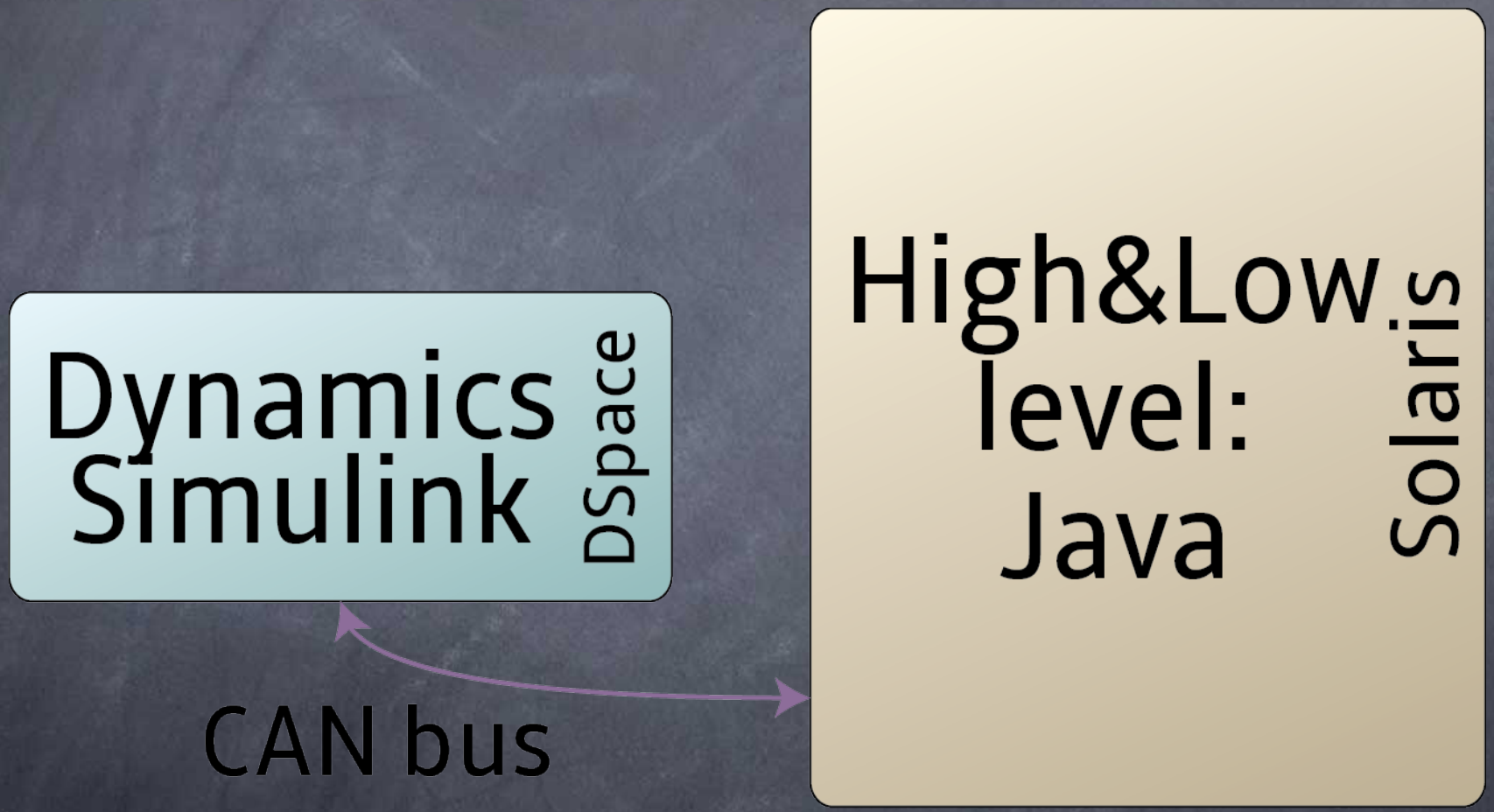
- An autonomous high-speed vehicle
- Skidding!

# First, a Video

# Old Architecture



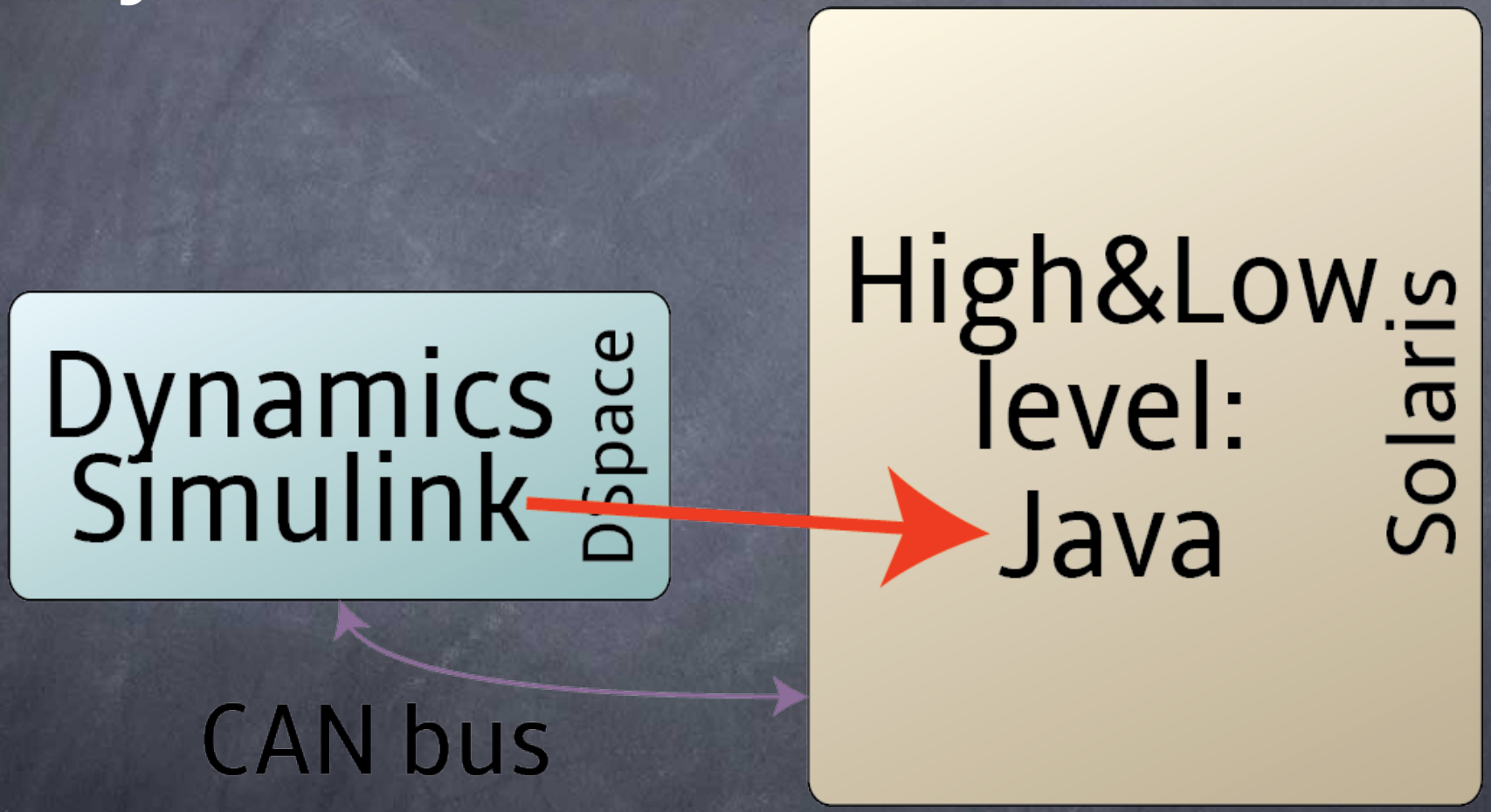
# Current Vehicle



# Can do

- Smooth surfaces fast
- Or irregular surfaces slow
- But not both

# My Task


Dynamics
Simulink
Dspace
CAN bus
High&Low
level:
Java
Solaris

# Endstate

High&Low level +Dynamics: Java

Solaris

# Matlab+Simulink

- Entrenched in engineering and science
- Matlib: fortran+apl+ javascript
- Simulink: a visual programming metaphor for simulation
  - and a way to simulate

# Used Outside the Original Domain

Lets look at some code!

# A True domain specific language

- For non-CS majors
- Who think in math
- Live in a world of infinite parallelism
- Where time is continuous

Viewed from a CS point of view

- Poor structuring
- Poor performance
- Scoping is horrific
- Doesn't scale

Domain-specific language by domain specialists

# Can boil down to something simple

- From a CS point of view
- Lets look at some more code

CS folks are bad at getting in other folks heads

# Languages as UI

- A different kind of User
- A different kind of Interface

# Don't lose the Math!

# Archaeology@JPL

# ACE: Software as transformations on algorithms

# Computer Science is not Solved

- peek outside the bubble!
- but too many hard problems don't fit the "PhD topic" mold

It's a Journey