



What may not be expected in a country of eternal light?

The Promise of Using DSLs for GIS
Applications with Scala, Lift, JQuery,
& ESRI

Noel Weichbrodt
Strange Loop 2012



A retrospective with
literary pretensions



TL;DR:

Programming languages limit
how you are allowed to think but
allow for powerful abstractions.



TL;DR:

Frankenstein is more relevant to your work than you have been led to believe.



*Frankenstein; or, the
Modern Prometheus*
by Mary Shelley

Frankenstein; or, an Ancient Rage





“I, the miserable and
the abandoned, to be
spurned at, and
kicked, and trampled
on...”

—Daemon
Frankenstein



“Learn from my
miseries, and do not
seek to increase your
own”

—Victor Frankenstein
Frankenstein

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Broadband Community Search Tool

This tool provides a listing of the communities where RUS has provided funding to construct broadband infrastructure. These communities may be ineligible for funding under the Broadband Loan Program, provided that certain requirements in 7 CFR 1738 are met. For additional information about these requirements, please see 7 CFR 1738.102.

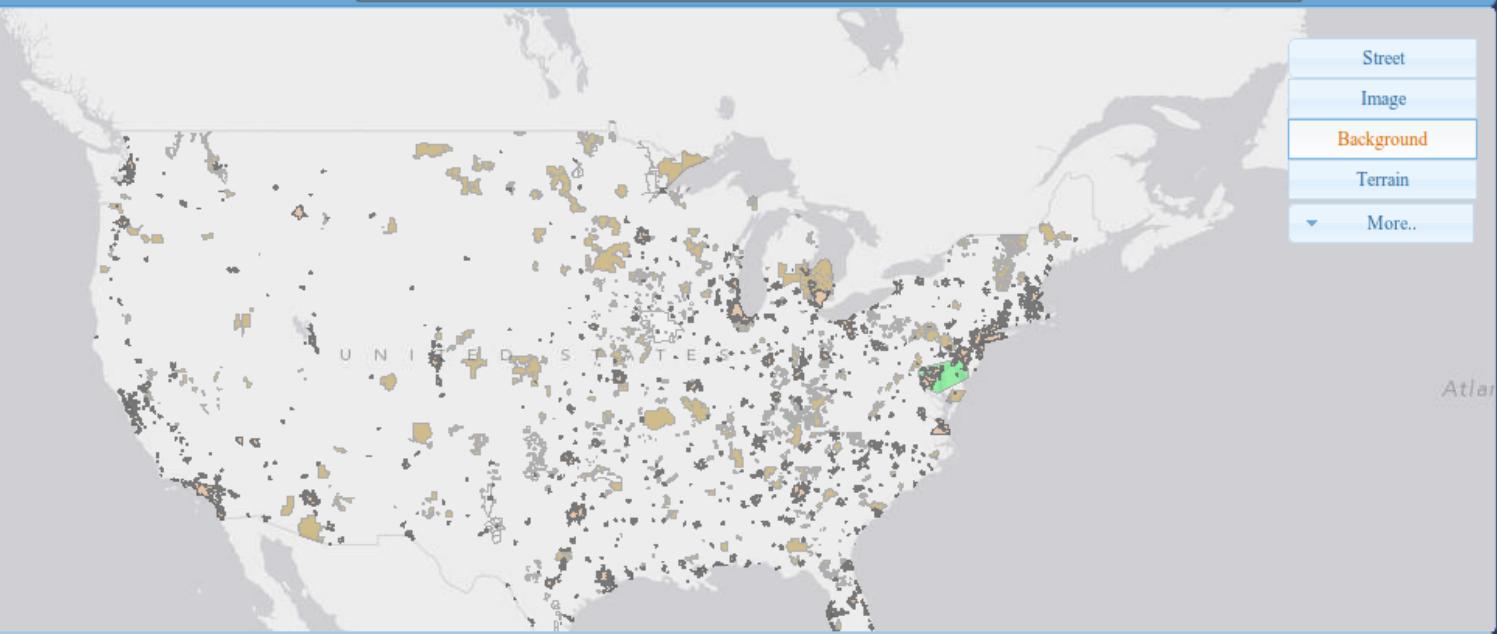
PAUL BUNYAN RURAL TELEPHONE COOPERATIVE (MN) (Company)



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1:36,978,595 or 1" = 584 miles

53° 13' 10.52" N, 56° 44' 12.1" W

0 300 600 mi

Found 2 matching applications

(in progress)



“The ancient teachers of this science promised impossibilities and performed nothing. The modern masters promise very little...but these philosophers, whose hands seem only made to dabble in dirt, and their eyes to pore over the microscope or crucible, have indeed performed miracles.”

—Prof. Waldman
Frankenstein



“Invention, it must be humbly admitted, does not consist in creating out of void, but out of chaos; the materials must, in the first place, be afforded... Invention consists in the capacity of seizing on the capabilities of a subject, and in the power of moulding and fashioning ideas suggested to it.”

—Mary Shelley
Introduction to Frankenstein



“A flash of lightning illuminated the object, and discovered its shape plainly to me; its gigantic stature, and the deformity of its aspect, more hideous than belongs to humanity, instantly informed me that it was the wretch, the filthy demon, to whom I had given life.”

—Victor Frankenstein
Frankenstein

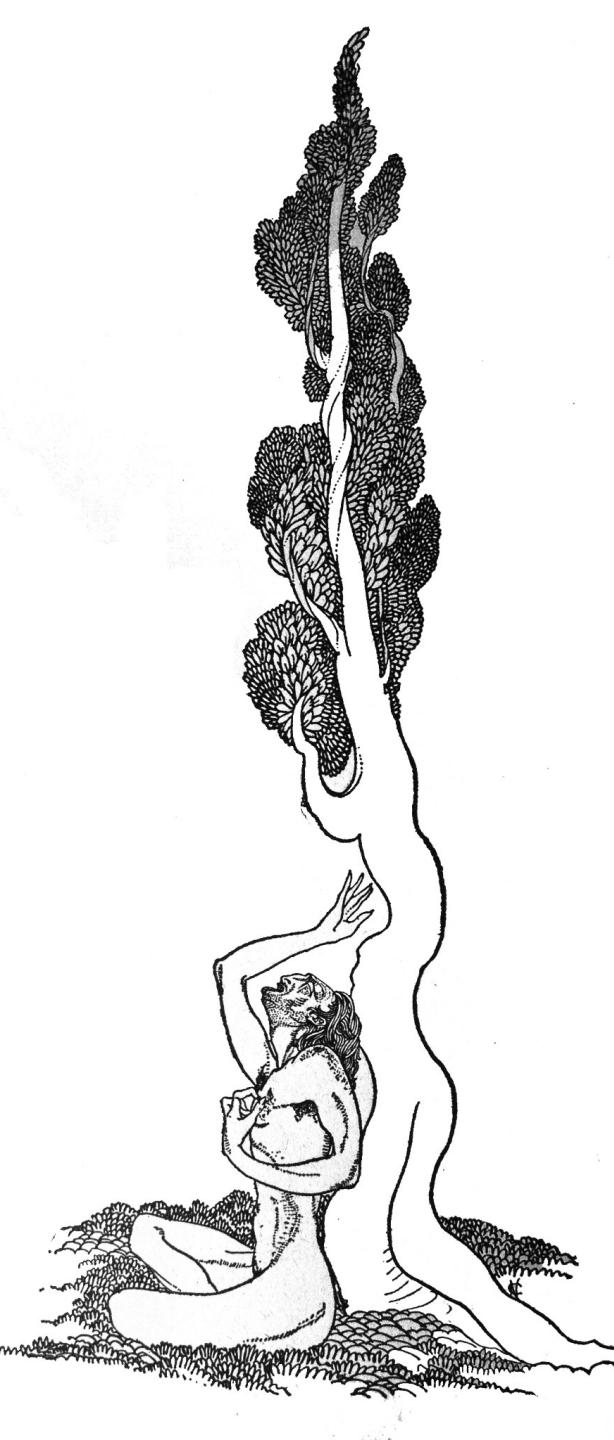


Oracle 11g
SQL Server 2008
ESRI MapServer SDE
Oracle JVM 6
Old version of Typesafe Stack
(Scala, ScalaQuery)
Lift
Maven
Jetty/JBoss
Dojo
JQuery
ESRI Javascript API
Bing Maps API



“The working of some powerful engine, show signs of life and stir with an uneasy, half-vital motion.”

—Mary Shelley
Introduction to Frankenstein



HTML templates
XML config files
ESRI Javascript objects
RESTful map service
GIS metadata
Javascript mediator
Lift HTTP pipeline
Rendered HTTP response
AJAX transforms on the data
visualization





“You are my creator,
but I am your master.
Obey!”

—Daemon
Frankenstein



scala.xml

“Unfortunately, Scala’s XML library is very...weird”

—DJ Spiewak

Working with Scala’s XML Support



net.liftweb.http.js

“A sort-of DSL for Lift's
Javascript
abstractions”

—Peter Robinett
Lift Mailing List



org.scalaquery

“A type-safe relational
database query DSL
for Scala.”

—Stefan Zeiger
ScalaQuery Website



esri.js

“It's like they took
ArcObjects and made
it awesome!”

—Nobody
Ever

Apple Store



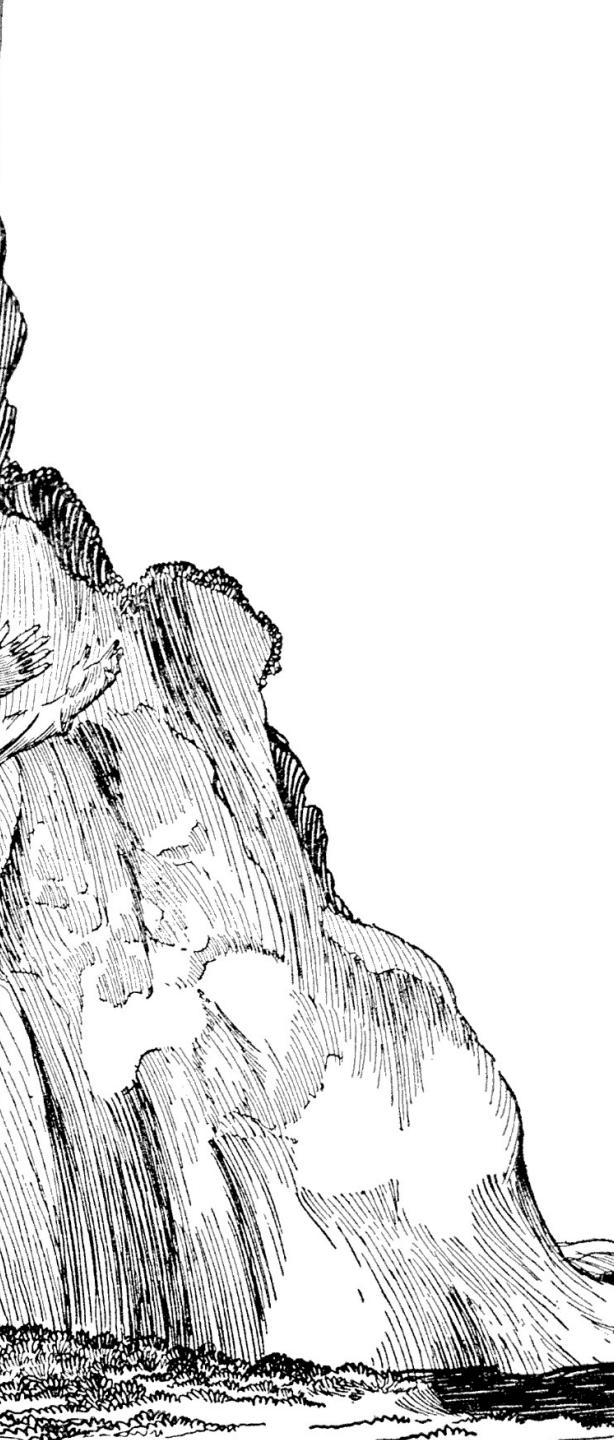
No Results Found

OK



“How much happier
that man is who
believes his native
town to be the
world.”

—Victor Frankenstein
Frankenstein



The JQuery DataTables case

```
//Example JSON object formatted as DataTable data

{"aaData": [
    [ "Paul Bunyan Telephone Company", "Missoula, MT", "(Company)", "180021", "20133", "3123543" ],
    [ "Paul Bunyan Telephone Company", "Missoula, MT", "(Company)", "180021", "20133", "3123543" ],
    [ "Commonwealth of Virginia PLLC", "Richmond, VA", "(Company)", "180021", "20133", "3123543" ],
    [ "Chickasaw Territory", "Chickasaw Sovereign Nation", "Community", "180021", "20133", "3123543" ],
    [ "Blackfoot Reservation", "Blackfoot Nation", "(Community)", "180021", "20133", "3123543" ],
    [ "Montana", "Montana", "(State)", "180021", "20133", "3123543" ],
    [ "Oklahoma", "Oklahoma", "982131", "1848", "673456" ],
    [ "Virginia", "Virginia", "(State)", "19236", "2094", "456" ],
    [ "Chickasaw", "Oklahoma", "(County)", "6", "76453", "8123" ]
]}]
```

```
def getGeoEntitiesNameMatches(term:String): List[String]
= {
    val communities = for { s <- model.CommunityTable if
(s.name startsWith term) }
        yield s
    val companies = for { s <- model.CompanyTable if (s.
name startsWith term) }
        yield s
    val states = for { s <- model.StateTable if (s.name
startsWith term) } yield s
    DatabaseSession.session() withSession {
        communities.list.map(c => c.name + " (" + c.
stateCode + ")" + " (Community)") :::
companies.list.
map(c => (c.name + " (" + c.stateCode + ")") (Company)))
:::
states.list.map(n => (n.name + " (" + n.abbreviation
+ ")" (State))))}
```

//Col]
json c
result

def ge
val
val
val
val
val
id=" -
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pnfCon
head._
_1).ge
_2.he

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the

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et(a.

l._8,
a._2.

et.
.head.

l, a.

)~





“The beauty of the dream vanished, and breathless horror and disgust filled my heart.”

—Victor Frankenstein
Frankenstein



“Had I the right, for
my own benefit, to
inflict this curse
upon everlasting
generations?”

—Victor Frankenstein
Frankenstein



Language is
abstraction, and
abstractions leak.



A good DSL needs
short-circuits to allow
you to emit the
desired result directly.



Don't wander away
from the operating
table in the middle of
surgery.



“Treading in the steps already marked, I will pioneer a new way, explore unknown powers, and unfold to the world the deepest mysteries of creation.”

—Victor Frankenstein
Frankenstein



My mundane struggles are
elevated by the language of an
amazing writer.

A portrait painting of Mary Shelley, showing her from the chest up. She has dark hair and is wearing a dark, low-cut dress over a white blouse. The background is dark.

Mary
(Wollstonecraft–
Godwin)
Shelley
was awesome



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S.D.G.