Dinkar Ganti

Summary

An experienced, passionate technology professional who is convinced about the value that agile, mob programming and functional programming languages such as Haskell, OCaml can bring in delivering world class solutions. I am interested in implementing distributed systems, dependent types and program verification using languages such as Coq for formal verification. I am also interested in languages such as Rust.

Aug 2018 - Present, Conduent Inc

Technnology Strategy

Defining and implementing a technology strategy to deploy enterprise block chain applications. My contributions at this role include,

- Implementing an architecture that supports real-time and REST interactions using Yesod.
- Building constant memory components using streaming API libraries such as Conduit.
- Upgrade an open source gRPC Haskell library using c2hs (Haskell FFI) to support versions greater than 1.18
- Integrate with Apache Kafka for resiliency using Haskell library wrapper on librdkafka.
- Design a cloud Haskell based system to scaling applications running on pods.
- Design and specification of a hardware wallet based tamper-proof identity management system.
- Design a client library to deploy/specify Kubernetes pods and components.

Software development methodology

- Setup a mob-programming mentality within the team.
- Setup a framework to exchange DDD (domain driven design) using Applicative Functors and Validation libraries.
- Documented designs using diagrams (a pretty neat library).
- Implement specification, deployment pods for Kubernetes built on top of Kubernetes Haskell client library.
- Implement testing strategies using HedgeHog.

Sep 2017 - Aug 2018

Vice President - Morgan Stanley

Implemented program transformation in Scala using Kiama and real-time streaming with Apache Kafka.

Feb 2016 - Aug 2017

Software engineer (Sr) - Jet Inc

At Jet I was involved in implementing RESTful and Kafka clients in FSharp. I was responsible for significantly scaling an application after fixing some concurrency bugs in FSharp.

Startup experience

I was at a couple of startups where I was involved in wearing multiple hats including presenting at trade shows, conferences and anything else that was required.

- At LifeConnect Inc., I was involved in
  - Design and implementation of DCAF (a publish/subscribe) framework in Java. This included extending the Command design pattern to include a configuration mechanism that would enable simple setup for clients. The ease-of-setup of this pattern has found its way into many of LifeConnect products. The pattern is informally termed "Command-Executor" pattern. This pattern helped control the hierarchy of commands and allowed executors to vary independently of the commands.
  - Designed and implementation of a multi-threaded publisher/subscriber n-tier messaging framework. This framework forms the core information bus for LifeConnect products including its web portal with the same name.
  - Design and implementation of the DCAF-CORBA using VisiBroker for Java.
- As a consultant for Kada Systems,
  - Implemented Java IO, JMS, JDBC and the concurrent real-time garbage collector as part of a clean room implementation of the Java Virtual Machine.
- At PrepGames Inc.,

– I recommended using Apache Kafka and GridGain for event logging and managing inventory counts accurately in a distributed environment.

March 2014 – Oct 1998 (worked at several companies, please email me for details)

- Camel based websockets applications.
- Rewrote CCAR parser in Haskell, Yesod, Haxe and Python using Julia to perform real-time computations on Options.
- Design a language to describe scenarios for supporting CCAR (Comprehensive Capital Analysis and Review) at a large bank.
- Design and implement gaming solutions for education for a startup in New York.
- Maintenance of a low-latency FIX trading engine for equities application.
- Develop SmartFoxServer extensions for a MMO using Java/Hibernate and MySQL with Testng for test driven development.
- Develop a mmo Tank game (never released) for a game development in Benulux.(http://benlsoft.com/team).
- Develop a real-time system using SmartFoxServer, Flex 3.0 and Terracotta for fault-tolerance.
- Develop and design a multi-user(2) player game with a flash front-end using MINA for Java server, mysql for database access and action script based socket to communicate with the server using xml for application level message communication for Jig Technologies, Toronto.
- Develop a multi-threaded server for automated generation of FIX (IOI) messages based on capturing real-time order flow in Java for cash equities.
- Market data analysis for level I and level II data using real-time databases such as Q (kdb plus) for cash equities.
- As a consultant for Kada Systems, implemented Java IO, JMS, JDBC and the concurrent real-time garbage collector as part of a clean room implementation of the Java Virtual Machine.
- Design and implementation of a complaint tracking system using Laszlo, Hibernate and XStream.
- Design and implementation of JSP, Java, MFC C++ based multi-threaded applications for an annuities processing institution using JDBC.
- Design and implementation of a workflow-based business application using a 2 tiered architecture with a clean separation of interface and business using JDBC as well as Hibernate.
- Implementation of SessionListeners for session cleanup, ServletListeners to manage context specific process, long running threads etc.
- Design and implementation of JSP-based web applications using Tomcat 4.1.
- Object-oriented design, architecture and development and maintenance of Ticker Plant(TP) on HP-UX 11.0 using UML, C/C++ and Versant.

- Design and implementation of publishing application pipelines in Apache Cocoon.
- Design and implementation of DCAF (a publish/subscribe) framework in Java. This included extending the Command design pattern to include a configuration mechanism that would enable simple setup for clients. The ease-of-setup of this pattern has found its way into many of LifeConnect products. The pattern is informally termed "Command-Executor" pattern. This pattern helped control the hierarchy of commands and allowed executors to vary independently of the commands.
- Designed and implementation of a multi-threaded publisher/subscriber n-tier messaging framework. This framework forms the core information bus for LifeConnect products including its web portal with the same name.
- Design and implementation of the DCAF-CORBA using VisiBroker for Java.
- Design and implementation a thread-safe exception handling mechanism that handled network and application errors in a streamlined manner thereby allowing the system to recover. This allowed the system to send "Close" messages to clients and effect a controlled shutdown.
- Design and implementation of built-in retry mechanisms for all clients and servers in the n-tier network. This system integrated with the multi-threaded exception handling system for detecting broken connections and activating backup starts.
- Created a logger and shadow recovery threads for recovery and logging purposes. This allowed for keeping track of all the commands for the router.
- Design and implementation of a graphical representation DCAF system objects in Smalltalk using the Composite and delegation patterns to display the composite.
- Design and implementation of classes in Smalltalk for integrating multiple language support for the system enabling the user to change the language of the GUI dynamically. The design used a dictionary with keys as application-specific strings and values as the desired string using GemStone Smalltalk to store all the persistent classes that needed to be shared.
- Design a self-contained command queue for each server application enabling us to allow multiple requests
- Create a logger and shadow recovery communication for backup, recovery and logging purposes.
- Implementatin of a protocol for receiving and transferring large amounts of data on the POTS line using a TAPI library(developed inhouse) and according to the specification laid by the device manufacture. Example include, uploading vital signs, SPO2, Temperature, Blood pressure etc.

Personal Projects

- Jan 2014 - Jan 2017

  - Implemented a model to represent CCAR (comprehensive capital analysis and review) in Haskell including
  - Implement a Haskell webserver supporting realtime updates and multi-core friendly using Yesod, Conduit running on PostgreSQL database.
  - Implement a Julia engine to perform theoretical option computation with some assumptions.
  - Implement a python3 based websockets libreoffice plugin to allow a trader to view the portfolio and perform local algorithms. For larger datasets, the user will still need to upload the algorithm on to the cloud.
  - Ability to upload R scripts to run them on the server using stored data.
  - Discontinued the project, here is a link to the demo
- Dec 2019 - present
  - Working on building a statistical model for bio-degradation of PCE (perchloroethene) to TCE (trichloroethene), cis DCE (cis Dichloroethene) and trans DCE (trans dichloroethene) in Haskell. Initial model assumed a simple exponential decay for PCE degradation, and derivative degradation for TCE. The model has many issues and doesnt scale to indoor air yet. Additional libraries used for this project are plotlib for plots and charts.
  - Generate haddock documentation for the modules and types.
  - Learning TensorFlow in Haskell; fixed an issue in the repository to compile the project.
  - Working on evolving a model that can predict the state of contamination based on various inputs.

Education

1988–1992 - Bachelor of Engineering (Bachelor of Science in Electrical Engineering), Osmania University, India

Email : dinkar.ganti@gmail.com