K.Srinivasan   - ஸ்ரீநிவாஸன் கண்ணன் - श्रीनिवासन् कण्णन्

(also spelt as: Srinivasan Kannan, Ka.Shrinivaasan, Shrinivas Kannan)

Permanent Address:

Srinivasan Kannan,

S/O. (Late) P.R.ES.Kannan,

172, Gandhi Adigal Salai,

Kumbakonam-612001, TamilNadu, India.

e-mail : ksrinivasan@krishna-iresearch.org

ka.shrinivaasan@gmail.com

shrinivas.kannan@gmail.com

kashrinivaasan@live.com

Mobile :9789346927

Name spellings in consultancy/employer/academic records :   K.Srinivasan (academics, BaaN,Sun Microsystems), Kannan Srinivasan (Sun Microsystems),

Srinivasan Kannan (Verizon, Clockwork Interviews,   CloudEnablers), Shrinivas Kannan(webMethods/SoftwareAG and CMI), Ka.Shrinivaasan (Global Analytics)

Personal website(research) :-

https://acadpdrafts.readthedocs.io

NeuronRain Documentation:- https://neuronrain-documentation.readthedocs.io/en/latest/

Krishna iResearch Open Source Repositories:

https://sourceforge.net/users/ka_shrinivaasan,

https://github.com/shrinivaasanka,

https://gitlab.com/shrinivaasanka

OpenHub profile:

https://www.openhub.net/accounts/ka_shrinivaasan

Krishna iResearch TLD:

https://krishna-iresearch.org/

Krishna iResearch GitHub Organization:

https://github.com/Krishna-iResearch

BRIHASPATHI - Private Virtual Classrooms:

GitHub -

Private repositories of virtual classrooms for various commercial online courses (for graduate students and professionals - requires GitHub student logins) - BigData and Machine Learning, Topics in Mathematics and Computer Science, Linux Kernel and Cloud, Vedic Astrology, English, Hindi - https://github.com/Brihaspathi - Consultancy offered on BigData-Machine Learning, Linux Kernel-Cloud and other IT arena, Vedic Astrology (Brihaspathi Jyotish Vigyan Kendra - https://github.com/Brihaspathi/BrihaspathiJyotishVigyanKendra - ப்ரிஹஸ்பதி ஜ்யோதிஷ் விக்யாந் கேந்த்ரா - Personal reading, Matrimonial matchmaking,...)

JAIMINI Closed Source Derivative of NeuronRain:

GitHub - https://github.com/Brihaspathi/jaimini

SourceForge - https://sourceforge.net/projects/jaimini/

GitLab - https://gitlab.com/shrinivaasanka/jaimini

LatexPDF CV:

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/CV.pdf

Date of Birth as per records: 19 May 1977

Passport: M9583737

PAN: AOVPS2844F

Aadhaar: 772717942542

Marital status: Unmarried (Never Married)

COMPLETE ACADEMIC AND WORK HISTORY

ACADEMICS

1. Elementary Schooling, RC Morning Star, Kumbakonam (1982-1987)

2. Higher Secondary, Town Higher Secondary School,Kumbakonam (1987-1994) (SSLC -470/500 and Plus Two 1115/1200)

3. B.A - Hindi - Praveen Uttarardh – Dakshin Bharat Hindi Prachar Sabha,Chennai (privately tutored from Kumbakonam) – (1988-1992)

4. Bachelor of Engineering (Computer Science & Engg) (1995-99),
PSG College of Technology, Coimbatore-641004 INDIA
(CGPA/Percentage: 8.8/87.75)

5. M.Sc (Computer Science), Chennai Mathematical Institute, Chennai (2008 – 10) CGPA 8.08 (coursework - excluding MSc thesis), 8.06(including MSc thesis)

6. Ph.D (Research Scholar in Computer Science), Chennai Mathematical Institute, Chennai (coursework, TAC 2010 - expansion of MSc thesis above - and Complement Function miniproject - August 2010 – August 2011) – resigned due to personal reasons and went back to Industry. Presently pursuing independent research.

COURSES DONE IN M.Sc and Ph.D and Self-study

M.Sc courses [CMI and IIT-Chennai] and self-study (2008-2010):

Haskell, Operating systems, Distributed systems, Theory of computation, Databases,Logic-1, Complexity-1,

Principles of Programming Languages(Java and lambda calculus), Algorithms, Graph theory, Cryptography, Datamining-1, Information Retrieval, AutomataConcurrencyTimedSystems

Ph.D courses[CMI and IMSc] and self study (August 2010 - October 2011):

Complexity-2, Topics in data mining(Recommender Systems,Streaming Algorithms), Randomized algorithms(including PTAS), Logspace computation, Program Verification, Program Analysis, Program Slicing, Computational number theory and algebra, Computational geometry, Expander graphs, Combinatorics(Generating

functions), Probabilistic method, Communications Complexity, Linear Programming And Combinatorial Optimization and Computational Biology (BioInformatics) algorithms for sequence alignment.

PUBLICATIONS

(Google Scholar URL - http://scholar.google.co.in/citations?user=eLZY7CIAAAAJ&hl=en)

1.(During PhD) Decidability of Existence and Construction of a Complement of a function with Prof.Meena Mahajan, IMSc, 2011

(http://arxiv.org/abs/1106.4102)

- Some unreviewed draft additions to the above for Complement Function Circuit and its connection to Riemann Zeta Function, Ramanujan graphs and Ihara

Zeta Functions are at: http://sourceforge.net/p/asfer/code/HEAD/tree/AstroInferDesign.txt with some illustrations:

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/

RamanujanGraphsRiemannZetaFunctionAndIharaZetaFunction.pdf?attredirects=0&d=1

and

https://github.com/shrinivaasanka/

Krishna_iResearch_DoxygenDocs/blob/master/

kuja27_website_mirrored/site/kuja27/

RZFAndIZF_25October2014.pdf?attredirects=0&d=1

2.(Master's Thesis) Few Algorithms for Ascertaining Merit of a document (Citation graph Maxflow, Recursive Gloss Overlap Algorithm and Interview algorithm applying either of the previous two with applications of them) with Profs. Ravindran(IIT Chennai) and Madhavan Mukund (CMI) in

2009-2010 – http://arxiv.org/abs/1006.4458.

3. (During PhD) Evaluated NIST TAC 2010 dataset

(Summarization track) for

Update Summarization by applying Interview Algorithm -

appeared in proceedings of TAC 2010 at:

http://www.nist.gov/tac/publications/2010/

participant.papers/CMI_IIT.proceedings.pdf

RESEARCH STATEMENTS:

4. Research Statement 1 - https://github.com/shrinivaasanka/

Krishna_iResearch_DoxygenDocs/blob/master/

kuja27_website_mirrored/site/kuja27/ResearchStatement2.pdf?

attredirects=0

5. Research Statement 2 - with some proof sketches (includes a new timeout manager algorithm implemented in Global Analytics Decision Platform 3.0) - https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/PhDThesisProposal.pdf?attredirects=0

6. Research Statement 3 – with some proof sketches - https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/Research_Writeup.pdf?attredirects=0&d=1

Complexity Theoretic Analysis of Non-majority and Majority Social Choice, Majority Voting Boolean Composition Circuit and KRW Conjecture, P versus NP, ABC Conjecture, Four color Theorem, Zorn Lemma, Axiom of Choice (AOC), XOR Lemma and Hardness Amplification, Circuit Lowerbounds, Pseudorandomness(generators and extractors), Goodness of Voting and Margulis-Russo Threshold/Condorcet Jury Theorem (and its recent versions by [Black], [Ladha]),

Theoretical Electronic Voting Machines and Pre-poll -Post-poll Analytics, Vowelless Syllable Boundary Text Compression and Compressed Sensing, Computational Chaos, Polynomial Reconstruction Problem, Complement Functions - Complementary Sets and their Function Representation(e.g Beatty Functions), Combinatorics (Ramsey coloring of sequences), PAC Learning, Prime-Composite complementation and pattern in primes, Goldbach conjecture, Arithmetic Progressions, Diophantine Analysis and Representation, Riemann Zeta Function, Hypergeometric Functions, Clouds - Logical time and causality(EventNet), Formal Languages (Turing degrees, Embedding in vector space, Lambda Calculus, Category Theory, Logic) and learning lambda expressions from Natural Language Text, Cognitive Psychology - Grounded Cognition and ThoughtNet Evocation, Partial order

intrinsic merit rankings and Galois connections, Graph theoretic/Computational Neurolinguistic/Question-Answering Interview Intrinsic Merit/Fitness/Fame and Experiential Learning in the context of WWW (people, text, audio - speech and music, visuals-video and images, economies) and Social/Economic networks, Social Network Models - Cellular Automaton and Random Graph Diffusion of Concepts-Memes-Fads-Cybercrimes, Game Theory, BKS Conjecture and Question-Answering, Machine Translation, Algorithmic Graph Theoretic Learning Models, Computational Learning Theory, Software Analytics/Program Analysis/Debug Analytics, Operating System Kernel and Scheduler Analytics, Astronomical Analytics of Celestial Bodies and correlations to Seismic-Atmospheric-Oceanic events, Urban planning analytics, Computational Astrophysics - N-body problem, Media

Analytics and Advertisement Analytics, Preferential Attachment, Brand Loyalty and Business Intelligence, People Analytics/HR Analytics, Sports Analytics, Handwriting and Face Recognition for unique identification, Fame/Merit Equilibrium (Welfare Functions, Flow Market Equilibrium and

 Convex-Concave Programming in Algorithmic Economics applied to Fame-Merit) and Economic Merit(Intrinsic pricing),Cryptocurrencies and Money Trail (EventNet Graph),Optimal Denomination and Money Changing - Coin Problem,Mechanism Design, Time series analysis (economic and weather forecasts), Neural Networks and Deep Learning, Quantum mechanics and Intrinsic Fitness/Merit(Bose-Einstein condensation in networks), Locality Sensitive Hashing and Separate Chaining Hash tables,

Multiple Agent Resource Allocation, Integer Partitions(additive and multiplicative), Set Partitions, Space filling/Lagrangian Four Square Theorem Tiling/Circle Packing, Exact Cover, Random Closed Packing, Number Theory, Quadratic and Linear Programming, Cellular Automata, Satisfiability (Least Square SAT Solvers and QBFSAT), Random restrictions and Hastad Switching Lemma, Classical NC-PRAM-BSP (k-mergesort, segment tree, wavelet tree, ray shooting queries, planar point location, sorting networks,local search of rasterized hyperbolic segment arithmetic progressions), Randomized NC and Quantum NC Computational Geometric Integer Factoring, Rasterization of Algebraic Curves, Algebraic Geometry, Knot Theory, Topology and Connections amongst them -

(most recent draft updates to all publications previously

and earlier drafts below - in text

format - nonlinear theoretical writeups interspersed

between NeuronRain code commits in SourceForge,

GitLab and GitHub - links to relevant feature

implementations and theory drafts in design notes of

NeuronRain repositories -

AstroInfer,USBmd,VIRGO,KingCobra,GRAFIT,Krishna_iRese

arch_Doxygen_Docs,Acadpdrafts):

Krishna_iResearch_DoxygenDocs   (GitHub)

Krishna_iResearch_DoxygenDocs (GitLab)

Krishna_iResearch_DoxygenDocs (SourceForge)

Earlier Drafts:

7.(draft1) IntegerPartitions and Hash Functions

(https://github.com/shrinivaasanka/Krishna_iResearch_Doxy

genDocs/blob/master/kuja27_website_mirrored/site/kuja27/

IntegerPartitionAndHashFunctions.pdf?attredirects=0)

8.(draft2) IntegerPartitions and Hash Functions

(https://github.com/shrinivaasanka/Krishna_iResearch_Doxy

genDocs/blob/master/kuja27_website_mirrored/site/kuja27/

IntegerPartitionAndHashFunctions_2014.pdf?

attredirects=0&d=1)

9.(draft1) Interview Algorithm is in IP=PSPACE (https://github.com/shrinivaasanka/Krishna_iResearch_Doxy genDocs/blob/master/kuja27_website_mirrored/site/kuja27/ InterviewAlgorithmInPSPACE.pdf?attredirects=0)

10.(draft1) Few Non-trivial questions and Shell Turing Machines (https://github.com/shrinivaasanka/Krishna_iResearch_Doxy genDocs/blob/master/kuja27_website_mirrored/site/kuja27/ UndecidabilityOfFewNonTrivialQuestions.pdf? attredirects=0)

11. (draft1) Lower Bounds for Majority Voting and Pseudorandom choice -

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/ kuja27_website_mirrored/site/kuja27/

LowerBoundsForMajorityVotingPseudorandomChoice.pdf

12. (draft1) Circuits for computation of error probability in majority voting -

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/

[kuja27_website_mirrored/site/kuja27](https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27)/

CircuitForComputingErrorProbabilityOfMajorityVoting.pdf

13. (draft2) Circuits for computation of error probability in majority voting –

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/

[kuja27_website_mirrored/site/kuja27](https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27)/

CircuitForComputingErrorProbabilityOfMajorityVoting_2014
.pdf

14. (draft1) Indepth analysis of a variant of Majority

Voting with relation to ZFC -

https://github.com/shrinivaasanka/Krishna_iResearch_Doxyg

enDocs/blob/master/kuja27_website_mirrored/site/kuja27/

IndepthAnalysisOfVariantOfMajorityVotingwithZFAOC.pdf?

attredirects=0

15. (draft2) Indepth analysis of a variant of Majority

Voting with relation to ZFC -

https://github.com/shrinivaasanka/Krishna_iResearch_Doxyg

enDocs/blob/master/kuja27_website_mirrored/site/kuja27/

IndepthAnalysisOfVariantOfMajorityVotingwithZFAOC_2014

.pdf?attredirects=0

16.(draft1) A Chaos theoretic Parallel Pseudorandom

generator in RNC For Majority Voting and Pseudorandom

Choice

(https://github.com/shrinivaasanka/Krishna_iResearch_Doxy
genDocs/blob/master/kuja27_website_mirrored/site/kuja27/
ChaoticPRG.pdf?attredirects=0)

17. (draft1) Analysis of a Randomized Space Filling
Algorithm and its Linear Program Formulation
(https://github.com/shrinivaasanka/Krishna_iResearch_Doxy
genDocs/blob/master/kuja27_website_mirrored/site/kuja27/
Analysis%20of%20a%20Randomized%20Space%20Filling
%20Algorithm%20and%20its%20Linear%20Program
%20Formulation.pdf?attredirects=0)

18. (draft2) Analysis of a Randomized Space Filling
Algorithm and its Linear Program Formulation (Parallel
PRG and Cellular Automaton algorithm) -
http://sourceforge.net/p/asfer/code/HEAD/tree/AstroInferDes

ign.txt

19. (draft1) Discrete Hyperbolic Polylogarithmic Sieve For Integer Factorization (version 1) -

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization.pdf?attredirects=0&d=1

20. (draft2) Discrete Hyperbolic Polylogarithmic Sieve For Integer Factorization – with Interpolation Search (version 2) -

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_updated_interpolation_search.pdf?attredirects=0&d=1

21. (draft3) Discrete Hyperbolic Polylogarithmic Sieve For Integer Factorization – with Interpolation Search (version 3) -

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_updated_interpolation_search_30June2013.pdf?attredirects=0&d=1

22. (draft4) Discrete Hyperbolic Polylogarithmic Sieve For Integer Factorization – with Interpolation Search (version 4 and version 5 with handwritten illustrations and calculations) -

http://sourceforge.net/projects/acadpdrafts/files/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_updated

_interpolation_search.pdf/download

23. (draft5) Discrete Hyperbolic Polylogarithmic Sieve For Integer Factorization - using Rectangular Binary (or) Interpolation Search

http://sourceforge.net/projects/acadpdrafts/files/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_updated_rectangular_interpolation_search.pdf/download

24. (draft6) Informal Notes on Derivation of Upperbound for Discrete Hyperbolic Factorization with Stirling Formula - using Rectangular Binary or Interpolation Search (

http://sourceforge.net/projects/acadpdrafts/files/DiscreteHyperbolicFactorization_UpperboundDerivedWithStirlingFormula_2013-09-10.pdf/download)

25. (draft7) Discrete Hyperbolic Polylogarithmic Sieve For Integer Factorization – using Rectangular Binary (or) Interpolation Search and Upperbound derived with Stirling Formula

http://sourceforge.net/projects/acadpdrafts/files/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_updated_rectangular_interpolation_search_and_StirlingFormula_Upperbound.pdf/download

(a C++ implementation of this algorithm is at:

http://sourceforge.net/p/asfer/code/HEAD/tree/cpp-src/miscellaneous/DiscreteHyperbolicFactorizationUpperbound.cpp

and factorization result logs at: http://sourceforge.net/p/asfer/code/HEAD/tree/cpp-src/miscellaneous/)

26. (draft8) An NC algorithm and some Sequential Search Algorithms for Discrete Hyperbolic Polylogarithmic Sieve For Factorization using Binary or Interpolation Search

with Stirling Formula and Logarithmic Sorted Tile Merge in PRAM model - http://sourceforge.net/projects/acadpdrafts/files/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_PRAM_TileMergeAndSearch_And_Stirling_Upperbound.pdf/download

27. (draft 9) Parallel RAM algorithm for Discrete Hyperbolic Factorization - AsFer PRAM implementation design notes with tile id(s) (http://sourceforge.net/p/asfer/code/HEAD/tree/asfer-docs/ImplementationDesignNotesForDiscreteHyperbolicFactorizationInPRAM.jpg)

28. (draft10) Computational Geometric Factorization - An NC algorithm and some Sequential Search Algorithms for

Discrete Hyperbolic Polylogarithmic Sieve For Factorization using Binary or Interpolation Search with Stirling Formula and Logarithmic Sorted Tile Merge in PRAM model - updated draft with PRAM to NC reduction and input size details and references - http://sourceforge.net/projects/acadpdrafts/files/DiscreteHyperbolicPolylogarithmicSieveForIntegerFactorization_PRAM_TileMergeAndSearch_And_Stirling_Upperbound_updateddraft.pdf/download

29. Individual Invention Disclosure for Survival Index Based Transaction Timeout Manager (Sun Microsystems) - 2002-2003

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/SurvivalIndexBasedTxnTimeoutManager.pdf?attredirects=0

30. AstroInfer (AsFer) Open Source Product Design with theoretical interludes which substantially expand on the publications above -

http://sourceforge.net/p/asfer/code/HEAD/tree/asfer-docs/AstroInferDesign.txt

31. VIRGO Open Source Product Design with theoretical interludes -

http://sourceforge.net/p/virgo-linux/code-0/HEAD/tree/trunk/virgo-docs/VirgoDesign.txt

32. King Cobra - Byzantine distributed request servicing software design with queues and arbiters – theoretical interludes -

https://sourceforge.net/p/kcobra/code-svn/KingCobraDesign

Notes.txt

33. (draft1) Informal notes – 1 : on Implication Graphs, Error probability of Majority Voting and P Versus NP Question

http://sourceforge.net/projects/acadpdrafts/files/ImplicationGraphsPGoodEquationAndPNotEqualToNPQuestion_excerpts.pdf/download

34. (draft1) Informal notes - 2 : on Minimum Convex Hulls of Implication Graphs and Hidden Markov Model on class nodes of Concept Hypergraph

35. (draft1) Informal notes - 3 : on Minimum Convex Hulls of Implication Random Growth Networks and Perfect Voter Decidability

36. (draft1) Informal handwritten notes on Philosophical Analysis of Democracy Circuit and Pseudorandom Choice - https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/PhilosophicalAnalysisOfDemocracyCircuitAndPRGChoice_2014-03-26.pdf

37. (draft1) Informal Handwritten Notes - Distinct Partitions, Hash collision chains and Schur Theorem - https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/SchurTheoremMCPAndDistinctPartitions_2014-04-17.pdf

38. (draft1) Document Summarization from WordNet Subgraph obtained by Recursive Gloss Overlap -

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/DocumentSummarization_using_SpectralGraphTheory_RGOGraph_2014.pdf?attredirects=0&d=1

39. (draft1) Arrow's Theorem, Circuit For Democracy and Pseudorandom Choice and P Versus NP - https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob/master/kuja27_website_mirrored/site/kuja27/CircuitsForDemocracyAndPseudorandomChoice_and_PVsNP.pdf?attredirects=0&d=1

40. (draft1) Krishna iResearch Open Source Products (AsFer, USBmd, VIRGO, KingCobra, Acadpdrafts) - High Level Handdrawn Architecture Diagram -

http://sourceforge.net/p/acadpdrafts/code/ci/master/tree/

Krishna_iResearch_opensourceproducts_archdiagram.pdf

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41. (draft1) Miscellaneous notes on Krishna iResearch

Open Source products design, Democracy Circuit,

Complement Function circuit and Parallel RAM to NC

reduction for ANSV algorithm in Discrete Hyperbolic

Factorization

TEAM PATENTS (Sun Microsystems-Oracle)

1 8,521,875 T Identity for data sources

28,145,759 T Dynamically configurable resource pool

Disclosure - Patent Pending (Copyright: Sun Microsystems/Oracle - 2002 - Reference Number: P8490)

Survival Index Based Transaction Timeout Manager (Java PoC implemented on SunOne-iPlanet Application Server 6.5 J2EE-JTS Transaction Manager - now GlassFish - https://github.com/javaee/glassfish/tree/master/appserver)

DETAILS OF WORK (1999 – Present)

C/C++/Java/Python on Windows and various Unix flavours

PRODUCTS

Netscape Application Server 4.0, iPlanet/SunONE

Application Server 6.x, SunONE Web/Proxy Server 3.6/4.0, Apache web server 1.4.x/2.0.x, webMethods Broker Messaging Server 5.x/6.x/7.x, ASFER Classification and Inference Software for Large Data Sets (10.0,12.0,14.9.9,15.1.8,15.6.15), USBmd (1.0,3.0,14.9.9,15.1.8,15.6.15), VIRGO Linux Kernel Extensions for Cloud (5.0,6.0,7.0,8.0,10.0,12.0,14.9.9,15.1.8,15.6.15), Global Decision Platform(GDP) 2.3.0/ 2.3.1/ 2.5.0/ 2.5.1/ 2.7 /2.7.1/3.0, KingCobra (1.0,14.9.9,15.1.8,15.6.15), Automated Modelling Platform(AMP), Python 2.4.3 and 2.7 source code, Linux kernel [3.2.0, 3.7.8, 3.9.x, 3.15.5, 4.0.5, 4.1.5, 4.10.3, 4,13,3], Maitreya's Dreams 7.0.3, STL, BOOST, wxWidgets library, Swiss Ephemeris API (based on NASA JPL DE406 Ephemeris).

LANGUAGES/PLATFORMS/TOOLS

C/C++, Java 1.5-1.8, J2EE, Python, R and rpy2, Haskell, Solaris 6-10, Windows 2000, HP-UX 11.23 (PA-RISC and IA64),AIX, Linux, Sun Studio, CORBA (Visibroker), VAX FORTRAN, VAX VMS, GNU collection, MS Visual Studio .NET C++, WinDbg, DDD, Visual Basic and ASP, OptimizIt, Eclipse, EclipseCDT, Code::Blocks, ActiveState Python, Cython, IDLE, Haskell FP, Insight, GreatCircle, Valgrind, Callgrind, Python Dumbo MapReduce on Hadoop, Python NLTK, Java MapReduce on Hadoop, Apache HBase, Apache Pig, Apache Hive, Apache Cassandra, Apache Mahout, Apache Spark, Pygraphs, GraphViz, DOT, PiCloud, ActiveMQ, RabbitMQ, Pyutilib workflow, PyF workflow, Linux kernel – [3.2.0, 3.7.8, 3.9.x,3.15.5,4.0.5,4.1.5,4.10.3,4.13.3], Maitreya's Dreams

7.0.3, wxWidgets library, Swiss Ephemeris API (based on NASA JPL DE406 Ephemeris), BioInformatics Sequence Alignment Tools (BioPython, ClustalOmega), ROOT(CERN), Geolocation Python API, Beautiful Soup, CRF tools, GATE, SentiWordNet, Stanford CoreNLP, ENT, MongoDB, WEKA, Jinja2,Flask,Cloud related - Corestack, Openstack, Mistral, Jclouds, Libcloud, Docker etc.,Tornado,ZeroMQ,Kafka

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May 2003 – present – Krishna iResearch (parallel, self-started, not-for-profit, non-funded, open-source long-term research initiative) -

https://sourceforge.net/users/ka_shrinivaasan ,

https://github.com/shrinivaasanka ,

https://gitlab.com/shrinivaasanka

Working on Research, Design and Development of open source projects – a machine-

learning, cloud and queue augmented Linux kernel - NeuronRain - started by self, copyleft licensed under GPL v3 . Premium technical support is available for above opensource codebases. The GitHub repositories implement NeuronRain Green (for cloud and generic datasets), SourceForge repositories implement NeuronRain Research (for astronomical datasets) and GitLab repositories implement NeuronRain Antariksh (for Drone development). An introductory presentation on NeuronRain based Analytics is at:

https://github.com/shrinivaasanka/Grafit/blob/master/

EnterpriseAnalytics_with_NeuronRain.pdf

Latest version 2023#6#6:

Complete list of Features of NeuronRain (Research,Green and Antariksh): (*) could be found in NeuronRain GitHub,Sourceforge and GitLab design documents (Sections 1336,1337 and 1338 - text file in each repository) by "grep FEATURE <designdoc.txt>" or "grep 'THEORY and FEATURE' <designdoc.txt>"

1. NEURONRAIN - Krishna_iResearch_DoxygenDocs – FAQ and Documentation for AsFer, VIRGO, KingCobra, Acadpdrafts and USBmd open source product codebases which are subsystems of Krishna iResearch Intelligent Cloud OS - NeuronRain

(https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs ,

http://neuronrain-documentation.readthedocs.io/en/latest/)

2. NEURONRAIN - AsFer - AstroInfer astronomy and astrology machine learning inference open source software which uses algorithms viz.,

    2.1   Bayesian Classifier,

    2.2   Support Vector Machines,

    2.3   Decision Tree Classifier,

    2.4   String mining - Pairwise String Sequence Alignment (Needleman-Wunsch) ,

    2.5   String mining - Multiple String Sequence Alignment(BioPython,ClustalOmega),

    2.6   String mining - Powerset construction (C++) and String matching implementation in python(Jellyfish distance measures like Jaro-winkler, Edit-distance, Phonetic Matching rate etc.,) and

    2.7   Parsers and Encoding features for USGS and NOAA HURDAT2 data

2.8   Automated Generation of Training and Test

set for Classifiers that segregate the datasets into

Event Classes and Automated generation of

encoded astronomical object files specific to each

Event Class.

2.9   Computational Geometric Factorization -

Implementation of Bitonic K-MergeSort of Tiles in

Pixelated Hyperbolic Arc (Sequential and PRAM)

(for drafts in

https://github.com/shrinivaasanka/Krishna_iResearch_DoxygenDocs/blob

/master/kuja27_website_mirrored/site/kuja27/) - A Spark-Python-

C++ implementation of Parallel NC Factorization

has been included which internally executes NC

Bitonic tiles Parallel Merge Sort on Spark Cloud.

2.10   A Concept Hypergraph and HMM(Hidden

Markov Model) based Experimental Inference Model

Design inspired by Cognitive Psychology – a minimal sentiwordnet evocatives implementation of this sans HMM named ThoughtNet is part of AsFer

2.11   Design for extracting patterns from numerical data

2.12   Time Series Analysis - A Chaos Attractor implementation that generates a sequence of numbers using logistic equation and uses Python and R to compute a correlation coefficient between a non-Chaotic and Chaotic sequence of numbers.

2.13   Discrete Fourier Transform computation for a parsed numerical input sequence using Python and R

2.14   Time Series Analysis - Spline interpolation, LOESS regression, Approximate Linear Polynomial interpolation and graph plot for a parsed numerical

input sequence using Python and R (at present implemented for Dow Jones Industrial Average historical dataset and Riemann Zeta Function Zeros dataset)

2.15 An Experimental Text Compression algorithm that uses Hidden Markov Model Maximum Likelihood Estimation based on a String Complexity measure that compresses vowels in text

2.16 An Experimental Minimum Description Length implementation that uses the previous string complexity measure, computes MDL using Kraft inequality and Shannon entropy.

2.17 Probabilistic Approximate Correct – PAC - Learning Implementation related to

http://arxiv.org/abs/1106.4102

2.18 Wagner-Fischer edit distance implementation

for pairwise similarity of encoded strings

2.19 An example implementation of Interview Algorithm and Intrinsic Merit   Ranking for : http://arxiv.org/abs/1006.4458 and http://www.nist.gov/tac/publications/2010/participant.papers/CMI_IIT.proceedings.pdf

2.20   An experimental Expirable Objects implementation

2.21   Linear and Logistic Regression

2.22   K-Means clustering implementation

2.23   K-Nearest Neighbours supervised classifier implementation

2.24   Linear Perceptron with Gradient Descent Learning

2.25   Encoding of Maitreya Dreams to strings and some bugfixes for SWISS Ephemeris degree computation

errors

2.26	An experimental logical clock for cloud –
EventNet – using Python pygraphs and C++ boost::graph
with GraphViz rendering (from dot files)

2.27	Longest Common Substring implementation
for extracting common patterns in already classified and
clustered encoded strings dataset

2.28	Python script for translating the Pairwise
Longest Common Substrings obtained from a cluster of
Kmeans or KNN clustered astronomical dataset into rules
that correlate location of astronomical entities to a class
of events.

2.29	Utility Knuth-Morris-Pratt String Match
algorithm implementation

2.30	Multipurpose bigdata analytics subsystem
(storage abstraction on Cassandra/Hbase/Hive/File) for

computing metrics from datasets before and after processing by above ML algorithms.

2.31　　　Streaming Algorithms – Flajolet-Martin LogLog and HyperLogLog Counter implementations for computing cardinality (distinct elements) in streamed multiset data

2.32　　　Streaming Algorithms – CountMinSketch implementation for computing frequencies (heavy hitters) of elements in streamed multiset data

2.33　　　Streaming Algorithms - Bloom Filter implementation for membership query in streamed multiset data stored in Apache Cassandra/Hbase/Hive/File NoSQL tables or disk and stream-simulated through python Generator/Iterable abstraction

2.34　　　Pig script clients for Hbase/Hive and Python clients for Hive/Cassandra/Hbase

2.35   Apache Spark Python RDD Transformation MapReduce script for mining Linux kernel logs and exporting the mined data as config to VIRGO kernel_analytics module. This integrates the AsFer or other Machine Learning algorithms into VIRGO Linux Kernel (with USBmd, KingCobra modules).

2.36   Sequence Mining of ordered encoded strings (Apriori GSP Algorithm) for inferring Class Association Rules for USGS Earthquake datasets

2.37   Named Entity Recognition using Conditional Random Fields and Hidden Markov Models (skew normal distribution - by finding Viterbi path through Viterbi Dynamic Programming Algorithm)

2.38   Graph Search – Mine for Graph Relations (and render them in graphics) in Text Data by constructing the WordNet subgraph using the recursive

gloss overlap algorithm in http://arxiv.org/abs/1006.4458 and http://www.nist.gov/tac/publications/2010/participant.papers/CMI_IIT.proceedings.pdf

2.39   New Unsupervised text classification algorithm implementation that computes nodes with prominent core numbers and PageRanks (nodes with high core-numbers and PageRanks are names of the classes) in the definition graphs obtained by Recursive Gloss Overlap algorithm above.

2.40   Lambda Expression Compositionality from the depth first search closure of Recursive Gloss Overlap graph obtained from a text projected to WordNet.

2.41   Social Network Analysis – Graph creation from social networking sites data (LinkedIn profiles, Twitter Followers etc.,) and their Psycho-Social-Sentiment Analysis (Bonacich Power Centrality, Eigen Vector Centrality, Recursive Gloss Overlap Graph Sentiment Belief

Propagation and SentiWordNet based sentiment scoring etc.,)

2.42   Cloud Object Move (or) Cloud Perfect Forwarding implementation – This is a standalone client-server implementation that extends C++ std::move() and rvalue references to moving objects across cloud without copies. Functionality similar to this is required in KingCobra Neuro currency object transactional move without duplication.

2.43   Deep Learning – Convolution Neural Networks implementation (multifeature kernel maps) for a primitive pattern recognition

2.44   Deep Learning – Backpropagation in Multilayered Neural Networks implementation – applied to a Software Analytics usecase of CPU and Memory usage

2.45   Sequence Mining of ordered encoded strings

(Apriori GSP Algorithm) for inferring Class Association Rules for HURDAT2 NOAA Hurricane datasets

2.46   Dependency Injection based BigData Storage Backend Abstraction subsystem for SQL and NoSQL (MySQL, MongoDB etc.,)

2.47   C++-Python Embedding - Python CAPI Embedding which executes python machine learning scripts from C++

2.48   Config File Support for selectively enabling/disabling AsFer algorithms.

2.49   Web Spider implementation for crawl-scrape of URLs (e.g streamed news updates) with Scrapy Framework

2.50 Sentiment Analyzer implementation (with RGO algorithm etc.,) for Spidered Texts (e.g streamed news updates)

2.51 Streaming Frequency Estimation (Heavy Hitters) with CountMeanMinSketch implementation

2.52 An expanded implementation of Interview Algorithm and Intrinsic Merit Ranking with added complexity-machine learning theoretical analysis for :

http://arxiv.org/abs/1006.4458 and

http://www.nist.gov/tac/publications/2010/partici pant.papers/CMI_IIT.proceedings.pdf

that ranks a crawled-spidered webpage, writes a DOT file of the graph, visualizes the RGO NetworkX graph in matplotlib, constructs a junction tree and computes standard qualitative graph complexity measures (viz., connectivity, mincut, treewidth of junction tree etc.,) where as intrinsic merit is quantitative (depends on number of edges, vertices, extent of overlap and depth of recursion)

2.53 A rule search script that sifts through a range of astronomical data (with Maitreya-Swiss Ephemeris) and matches sequence mined rules from past training data to predict future weather phenomena (experimental).

2.54 Python Tornado based WebService that exposes REST API via a browser GUI in URL http://host:33333/neuronrain_auth At present a login and simple template that accepts AsFer scripts and arguments as inputs and executes, has been implemented (and an experimental redundant AngularJS client interface) With this NeuronRain is a SaaS and PaaS product that can be deployed on Cloud OS and Containers like Docker.

2.55 Apache Spark MapReduce implementation of Interview Algorithm and Intrinsic Merit Ranking (Global MemCache and Local dict() cache enabled) that parallelizes Recursive Gloss Overlap graph construction

algorithm in:

http://arxiv.org/abs/1006.4458 and

http://www.nist.gov/tac/publications/2010/participant.papers/CMI_

IIT.proceedings.pdf

and is thus deployable on large scale clouds. Presently

benchmarked on single node Spark cluster with local

threads SparkContext and various spark-defaults.conf

settings.

2.56 Singular Value Decomposition and Principal

Component Analysis - R+rpy2 wrapper implementation.

2.57 Approximation with a Probability Distribution –

Kullback-Leibler Divergence

2.58 Basic statistics – L1,L2 norms, median etc.,

2.59 A Generic Theory and Implementation of

Recursive Lambda Function Growth Learning Algorithm

based on Cognitive and Psycholinguistics of which

Recursive Gloss Overlap implementation is a special case.

2.60 Python-C-VIRGO Kernel – Cpython extensions – invoking VIRGO system calls (both VIRGO32 and VIRGO64 kernels) from Python userspace for dynamic setting of kernel analytics config key-value pairs

2.61 Python-C++-VIRGO Kernel – Boost::Python extensions – invoking VIRGO system calls(both VIRGO32 and VIRGO64 kernels) from Python userspace for dynamic setting of kernel analytics config key-value pairs

2.62 Cython Python-C compiler Optimization of previous PySpark Interview Algorithm implementation that has been benchmarked on single node cluster to have substantial performance gains.

2.63 Software Analytics – SATURN Program Analysis Software integrated with VIRGO – SATURN error logs are analyzable by AsFer.

2.64 Perl WordNet::Similarity support and WordNet hypernym-hyponym path subroutine for 2 text words.

2.65 Bitonic Sort implementation – Serial and Parallel on Spark – This can be used as a bigdata sorting tool for numeric data which is in NC when run on Cloud and is O(nlogn) in serial. In the absence of PRAM implementation, NC Bitonic Sort has been invoked as a suitable alternative in parallel tile merge sort step of Parallel Discrete Hyperbolic Factorization Implementation.

2.66 Long Term Short Term Memory Recurrent Neural Networks implementation

2.67 Reinforcement Learning – Contextual Multi Armed Bandit Evocation based on ThoughtNet - Monte Carlo Policy Search implementation and ThoughtNet evocative actions based implementation

2.68 File and Neo4j Graph Database ThoughtNet

hypergraph storage backend (which can be generalized to store any graph relations including WordNet subgraphs constructed by Recursive Gloss Overlap and can be queried in NoSQL)

2.69 Automatic ThoughtNet Hypergraph Creation from Recursive Gloss Overlap classified edges input from environment.

2.70 Software Analytics – Spark computed Cyclomatic Complexity of codebases from VIRGO linux SATURN driver generated .dot graph files

2.71 Audio Pattern Mining – Machine learning of patterns in music samples by computing Jensen-Shannon Divergence Distance between Fast Fourier Transform Frequency Probability Distributions of music data

2.72 Patterns within Strings – Longest Repeated Substring Implementation by Suffix Arrays – as a special

case pattern in binary encoded time series data is retrieved.

2.73 Locality Sensitive Hashing Implementation – for clustering similar documents and nearest neighbour search.

2.74 ZeroMQ CLI client and server frontend for concurrent requests to NeuronRain

2.75 Kafka Message Queue backend for AsFer datasource abstraction which includes KingCobra request-reply disk persisted queue.

2.76 Boyer-Moore Algorithm implementation for finding Majority element in Streaming Sequences.

2.77 Graph Mining – GSpan algorithm implementation for graph substructure mining – for extracting patterns in text-graphs and ThoughtNet/EventNet Graphs.

2.78 ThoughtNet Hypergraph Evocation based

Recommender Systems Implementation

2.79 Software Analytics – by Deep Learning (Convolution, RecurrentLSTM, RecurrentGRU, BackPropagation) from system performance logs

2.80 Polynomial representation of text strings and distance measures based on it (L2 norms and Jensen-Shannon divergence) – alternative to edit distance

2.81 Polynomial Reconstruction – Error correcting codes – BerlekampWelch decoder implementation

2.82 Approximate polynomial time 3SAT Solver – solves 3SAT with high probability depending on error of least squares algorithm (LSMR/LSQR/CVXOPT)

2.83 Java Spark Streaming and ETL for analyzing generic arbitrary URL data – extracts text from any URL with Jsoup and does Spark Dstream and RDD transformations and actions on it.

2.84 Deep Learning – Convolution Networks + Backpropagation Multilayered Neural Networks implementation for image pattern recognition(PILlow imaging library support).

2.85 Deep Learning – Recurrent Neural Networks – Gated Recurrent Unit implementation

2.86 Unified Streaming Abstract Generator ETL pipeline (Jsoup + Java Spark Streaming Parquet/Kafka/Cassandra/Hive/Logfiles + Java/Python Spark transformations and Loading)

2.87 Cloud implementations of recursive gloss overlap graph intrinsic merit, bitonic sort have been Benchmarked with Spark 2.1.0 and HiveServer2 Metastore is supported

2.88 Recursive Lambda Function Growth - Random Walk based intrinsic merit computation by growing recursive lambda function composition tree for each

random walk in Recursive Gloss Overlap Graph of a text

2.89 Korner Graph Entropy – an alternative Quantitative Intrinsic Merit measure for Recursive Gloss Overlap graph of a text

2.90 Usecases for deploying NeuronRain

2.91 Graph Theoretic alternative instrinsic measures for Recursive Gloss Overlap Graph based on Kleinberg small world lattice, Cheeger Constant

2.92 Index implementation for crawled documents with LocalitySensitiveHashing-Redis key-value store and ThoughtNet Hypergraph as backends

2.93 Small World Indexless Hyperball web crawler – based on Stanley Milgram, Kleinberg lattice Small world experiments and Hyperball algorithm.

2.94 Recursive Lambda Function Growth – maps text to a neural network - Graph Tensor Neuron Network

Intrinsic Merit which is amalgamation of Graph Neural Network and Tensor Neuron Network for evaluation of lambda function composition tree for each random walk in Recursive Gloss Overlap Graph of a text – supports both WordNet and ConceptNet

2.95 ThoughtNet Index and LSH Index Query from GUI and Rank text by Graph Tensor Neuron Intrinsic Merit and Korner Entropy

2.96 Unguided Text Summarization – based on Unsupervised Recursive Gloss Overlap graph core number classifier: traversal of k-core subgraph and sentences related to prominent core number class vertices

2.97 ConceptNet 5.6 Python RESTful Client implementation (a potential alternative to WordNet) – contains a Common Ancestor algorithm implementation for ConceptNet distance based on /related ConceptNet

(word2vec word embedding for similarity) REST endpoint

2.98 Unsupervised text classifier by ranking based on Betweenness Centrality, Closeness Centrality, Degree Centrality of the word vertices in Recursive Gloss Overlap graph of texts.

2.99 Scheduler Analytics from Deep-learnt process performance data for VIRGO Linux Kernel Scheduler (kernel_analytics VIRGO module)

2.100 Expander graphs - Graph Density (regularity lemma) and Bose-Einstein Condensation Intrinsic Fitness merit measures for Recursive Lamba Function Growth definition graphs of a text

2.101 MAX3CNFSAT ranking of intrinsic merit which unifies outcomes of all intrinsic merit algorithms as variables in a satisfiability CNF and approximately solves it by least squares solver.

2.102 Support Vector Machines Python Implementation

2.103 Computational Geometric Factorization - Spark Implementation of Optimized Parallel Local Binary Search of Pixelated Hyperbolic Arc Tile Intervals for Factor points – found to be faster than Bitonic K-MergeSort based Factorization in dual core single node Spark cluster benchmarks

2.104 Compressed Sensing – Compressed Sketch of an image bitmap – by Moore-Penrose Pseudoinverse

2.105 Non-trivial Proof-of-Work (recreate hash till it has 2 leading ff in hex) and Boost UUID hash (unique id concatenated with denomination) for fictitious Electronic Currency implementation in KingCobra (named "Neuro")

2.106 Neuro currency C++ move semantics - Option to choose between std::move and std::forward of rvalue

reference + std::move in zero-copy Perfect Forwarding of Neuro currency message over cloud

2.107 Complement Function Map construction - Diophantine Representation by SymPy Sum of Four Squares Diophantine Solver – for

https://arxiv.org/abs/1106.4102v1

2.108 Transactional and Secure Neuro Currency Perfect Forward – Neuro cloud std::move has been openSSL enabled and done in Python transaction manager boundary begin()/commit()

2.109 Implementation of Locality Sensitive Hashing based Algorithm for searching Unsorted Lists by dimension lift of one dimensional numerical dataset (similar to Mercer polynomial kernel)

2.110 Socket Streaming Generic Server Decorator for Streaming Analytics – iterator function has to be

implemented for a datasource and must be decorated by this Generic Socket Server – userspace counterpart of streaming kernel analytics in VIRGO64

2.111 Sequential Optimization algorithm for Computational Geometric Factorization

2.112 Integer Factorization by Brahmagupta/Pell Diophantine Equation Solver

2.113 Computational Geometric Factorization - Approximate and sometimes exact Integer Factoring by Hardy-Ramanujan Ray Shooting Queries

2.114 Recursive Lambda Function Growth – Rich Club Coefficient and Simple Cycles based graph tensor neuron intrinsic merit

2.115 Computational Geometric Factorization – Approximate Integer Factoring by Hardy-Ramanujan-Prime Number Theorem, Cramer, Baker-Harman-Pintz, Zhang

prime factors estimate ray shooting queries

2.116 ThoughtNet and Recursive Lambda Function Growth integration – ThoughtNet hypergraph edges are weighed either by SentiWordNet or Graph Tensor Neuron Network intrinsic merit

2.117 Epsilon bias non-uniform choice of literals for unequal number of variables-clauses and New efficiency measure for LSMR/LSQR SAT solver – real parity

2.118 Scheduler Analytics – Deep Learning (GRU,ConvNet,BackPropagation,LSTM) Scheduler Class analytics for process performance stream dataset created from Psutils and Graphic performance stream dataset (stream of images) created from Perf/BPF

2.119 Social Network Analysis - Facebook Graph REST API Analytics on Python 3.4

2.120 Quantum NC algorithm for Computational

Geometric Factorization – counterpart of classical PRAM-NC k-mergesort/segment-tree Computational Geometric Factorization

2.121 Deep Learning – Reinforcement Learning Recommender Systems and Recursive Lambda Function Growth integration – Recommender systems hypergraph edges are weighed either by SentiWordNet or Graph Tensor Neuron Network intrinsic merit

2.122 Spark Structured Streaming (Java 1.8 + Spark 2.4.x) for advertisement analytics – periodic word, count, timestamp information in DataFrames – windowed and non-windowed (timestamped)

2.123 Computational Geometric Factorization Algorithm based on Parallel construction of Wavelet Tree on PRAMs/Multicore

2.124 Latent Semantic Analysis/Indexing of term-

document matrices and Low Rank Approximation

2.125 Software Analytics – Userspace Runtime FlameGraph (along with Perf) and Valgrind/Callgrind/Kcachegrind Call Graph creation

2.126 Software Analytics – Graph Mining of linux kernelspace SATURN Control Flow Graph and userspace Valgrind/Callgrind/Kcachegrind Call Graph DOT files by Gspan algorithm

2.127 Streaming Algorithms – Approximate Counting implementation

2.128 Streaming Algorithms – Distinct Elements implementation

2.129 Software Analytics – GraphX/GraphFrames Parallel Graph Processing support for computing Cyclomatic complexity measures of code CFG.

2.130 Merit of Large Scale Visuals by ImageNet

based ImageGraph and VideoGraph EventNet Tensor

Products Algorithm Implementation – objects in frames of

video are annotated by Keras with Theano backend

2.131 Music Pattern Mining – Histogram timeseries

and Notes Onset Detection – sequence of notes in music

are deemed to be strings in a formal language

2.132 Social Network Analysis – People Analytics and

HR Analytics of Social and Professional Profiles by

Recursive Lambda Function Growth Graph Tensor Neuron

Intrinsic Merit, Log Normal Least Energy Intrinsic Merit

and Profile vertex degree based Experiential Intrinsic

Merit

2.133 Machine Translation – by mapping vertices of

Text Graph in Recursive Lambda Function Growth

implementation from English to any other Natural

Language – translation REST API in PyDictionary/GoSlate/

Googletrans invoked – sentence formation is by graph traversal

2.134 Software Analytics – Deep Learning (GRU,ConvNet,BackPropagation,LSTM) analytics for systemwide performance based on Psutil CPU/Disk/Memory load statistics – implements a NeuronRain usecase

2.135 Audio/Music Pattern Mining – Complexity Analysis of Intrinsic Merit of Audio/Music as String of Notes over octave alphabets – Minimum Description Length, Entropy, Minimum DFA etc.,

2.136 Pattern mining large scale visuals – Urban Planning/GIS Analytics - Convex hull analytics of GIS Images

2.137 Intrinsic Merit of Text analyzed as sequence of integers and Ramsey coloring of text graphs

2.138 NeuronRainApps – NeuronRain Usecases - Analytics Driven Drone Autopilot Online Shopping Delivery (requires DroneSDK-Python and Python 3.6+)

2.139 Software Analytics - /proc/sched_debug support for Scheduler Analytics – stream of processor runqueue dictionaries which can be analyzed by streaming and machine learning algorithms

2.140 Software Analytics + Streaming Analytics integration - Streaming Abstraction – Operating System Statistics as data stream which is analyzable like any other BigData Source

2.141 Intrinsic Merit of Music – Music Synthesizer from DFA (State Machine), Mathematical Functions and Random Samples

2.142 Intrinsic Merit of Music – Mel Frequency Cepstral Coefficient analysis

(implemented In GRAFIT course material as an example – Hashing Dynamic Sets and OS Scheduler Timer – complements previous streaming set partition analytics implementation In AsFer – alternative to rand index and mutual info)

2.148 Topological Handwriting Recognition – Deep Learning Convolution Backpropagation – Approximate DP Polynomial deformations from handwriting Image contours and distance similarity measure between DP polynomials

2.149 Intrinsic Merit of Music – Learning Weighted Deterministic Finite State Automaton from strings of musical notes (Python 3.7)

2.150 People Analytics – Tenure Histogram model of a professional profile - Partition Rank of Tenure Histogram Set Partition

2.151 People Analytics – Tenure Histogram vector

model of a professional profile – Kendall-Tau Rank Correlation Coefficients of Tenure Histogram Vectors

Function Growth Merits and Core Number based Dense Subgraph Classification of Speech text Recognized from audio

Drone EVM usecase

Machine - JSON persistence of EVMs - Datasource for Voting Analytics

of Earliest Deadline First Worst Case Execution Time OS Scheduler – AstroInfer codebase might import these cloud implementations

2.179 People Analytics – Election Analytics - Drone Electronic Voting Machine - Streaming Boyer-Moore Majority voting

2.180 People Analytics - Drone Electronic Voting Machine - Streaming Voting Analytics - Bertrand Ballot Theorem Approximation of Majority Voting

2.181 Astronomical Pattern Mining - Rule Search Script upgrade for Maitreya Dreams Swiss Ephemeris text client maitreya 8.0.1 (maitreya8t)

2.182 Merit of Large Scale Visuals – Python 3.x Tensor Rank intrinsic merit of EventNet of a video – measure of connectedness of a Video (Video mapped to EventNet Causality Graph) – Tensor Decomposition of

Video 3-way EventNet Tensor Product to Rank-1 tensor components by Tensorly – Slicing for footages of unequal frames

2.183 Computational Geometric Factorization - Quadcore Python 3.6,3.7.5,3.9.0 Upgrade Benchmarks – 60 bits, 512 bits and 1000+, 2000+, 4000+, 18000+ and 20000+ bits integers (1024, 1067, 1213, 1243, 2014, 2037, 2050, 2060, 2061, 2063, 4960, 18178, 18181, 20437, 20523, 20610 bits) – randomly chosen, smooth and hard

2.184 All NeuronRain Python 2.7 Source Files can be upgraded to PEP8 and Python 3.x by autopep8 and 2to3-2.7 utilities. Python 3.x is faster than Python 2.x and has many upgraded builtins including range(),tuned python malloc, async IO. Spark Factorization and EventNet Video Tensor Product implementations in NeuronRain have been

upgraded to Python 3.x for compatibility and performance.

2.185 Complement Diophantines – Python 3.7.5 upgrade and Least Squares Vandermonde Polynomial Fit Learning

2.186 People Analytics - Drone Electronic Voting Machine - Python 3.7.5 upgrade and Paper ballot shuffle simulation (and theory on paper currency unique id non-digital one time password, Money Trail – Neuro cryptocurrency transactional EventNet Ledger as Expander Graph and Random Walks in it - Pseudorandom Extractor and Generator for Unique Identification)

2.187 Chaos Pseudorandom Generators – Python 3.7.5 1-dimensional Binary Cellular Automaton, Mandelbrot set, Verhulst Logistic and Lehmer-Palmore PRGs implementation

Triangulation and Voronoi diagram of Segmented Image, Multi Agent 4-coloring of Urban Sprawl FaceGraphs for Fair Division of resources

Similarity, Music Clustering – alternative to Levenshtein edit distance of strings

2.199 People Analytics - Human Resource Analytics - Chaotic Hidden Markov Model of Tenures/Attrition – implementation – JSON persistence and Weighted Automata model

2.200 Recursive Lambda Function Growth – local lookup alternatives for machine translated multilingual textgraphs and proper noun filtering

2.201 People Analytics – LinkedIn DataSet - Tenure Statistics

2.202 Word Embedding on a Vectorspace - Spark SkipGram Log Likelihood - Text Similarity, Dissimilarity and Merit Measure of Originality (in GRAFIT)

2.203 People Analytics – R - Ricker Logistic – Population dynamics of urban sprawls (in GRAFIT)

Categories, Shell Turing Machines and Kernel

Lifting,Lambda functions and Beta Reduction, Meaning

representation (in GRAFIT)

2.209 People Analytics - Theoretical (Drone)

Electronic Voting Machines - Population Count - Number

of 1s (Decimal parity) in a bitstream - Various algorithms

- Parallel computation in Spark (in GRAFIT)

2.210 Bibliometrics - Patents as ProofNets and Search

- Novelty detection and Originality merit measure for

Patent search, Latent Semantic Analysis, Low Rank

Approximation (in GRAFIT)

2.211 Fraud and Cybercrime analytics – Faraday

Cageing for Van Eck Phreaking, Analyzing Userspace

Phishing/Spoof/Spams, Kernel Ftrace callgraph analyzer,

Address book and dictionary attacks, Bayesian Filters,

ERSIR, SIS and Cellular Automaton Graph models of

Cybercrime transmission – Datasets for CoronaVirus 2019 Pandemic R analyzers could be replaced by cybercrime Susceptible-Infected-Recovered random graph botnet data.

2.212 Fraud and Cybercrime analytics - Digital Watermarking of Large Scale Visuals in OpenCV (in GRAFIT)

2.213 Numeric Compression - Sublogarithmic Space Prime power encoding of huge integers by Unique Factorization Theorem and Computational Geometric Factorization and its application in CPU instruction sets (in GRAFIT)

2.214 NeuronRainApps - NeuronRain Usecases – PX4 Micro Air Vehicle SDK Python Asynchronous I/O Drone Simulator – Drone_MAVSDK_Client and Drone_MAVSDK_Server -requires PX4 Firmware + JMAVSIM + MAVSDK-Python + Python 3.7.5 (in GRAFIT)

Drone Obstacle Avoidance by 3D Navigation on Airspace defined by Road Geometry (Google Roads REST API and Drone Swarms example)

implementation for Strings – Strings as Tensors - alternative to Levenshtein Edit distance

2.225 Merit of Large Scale Visuals (LSVR) - TensorFlow + Keras Backend – alternative to Theano + Keras Backend

2.226 EventNet Python Parser - Events as Tensorflow Tensors – EventNet vertices and edges are parsed from text files and converted to Tensorflow Tensors

2.227 People Analytics - Alphabet Vectorspace Embedding - Earth Mover Distance between String Syllable Tensors

2.228 Graph Search and Analytics - NetworkX Graph Edit Distance – Inexact Graph Matching – Graph mining of dissimilar graphs

2.229 Software Analytics - Cyclomatic Complexity Program Analyzer - Graph Edit Distance – Inexact Graph

Matching for various types of Program analysis graphs (CFG,Slice dependency,Callgraph)

2.230 Text Analytics – Word Sense Disambiguation - NeuronRain implementation of Lesk's algorithm – alternative to NLTK and PyWSD

2.231 People Analytics - HR and Talent Analytics - Domain Specific Dictionary - LinkedIn Dataset analytics in Spark 3.0.1+ Hadoop 3.2

2.232 People Analytics - HR and Talent Analytics - Chaotic Hidden Markov Model - Career Transition Score of a Profile - Weighted Automaton of Career Transition

2.233 People Analytics - HR and Talent Analytics - Chaotic Hidden Markov Model - Career Polynomial of a Profile and Inner Product Space Distance Similarity between 2 people profiles

2.234 Software Analytics and People Analytics –

Program Analyzers in NeuronRain

could also serve as People Analytics tools specific to

Professional profiles of People in

Information Technology domain thus facilitating

automated recruitment of talent –

Cyclomatic complexity analyzers, Userspace and

Kernelspace Call graph analyzers, SATURN

kernel CFG analyzers could be useful in analyzing

complexity of any opensource code

repository

2.235 Bibliometrics - Merit of Academic Publications - Transformers Attention Model implementation (in GRAFIT)

2.236 Recursive Lambda Function Growth - Transformer Attention Model – Textgraph Degree attention

2.237 Named Entity Recognition - Transformers

Attention Model – Textgraph degree attention

linear equations

2.294 Set Partition Analytics - Complementary Set Partitions

2.295 GIS Urban Sprawl Analytics - NASA VIIRS NightLights Urban Area and Population Estimation – from training data of contour area to square kilometre area and average population density (GeoTIFF lookup and map projections have been ignored as they are data format specific)

2.296 GIS Urban Sprawl Analytics - NASA VIIRS NightLights 2012 and 2016 Urban sprawl distance similarity and Urban area rankings

2.297 GIS Urban Sprawl Analytics - NASA VIIRS NightLights 2016 and 2021 Urban sprawl distance similarity and Urban Area Rankings

2.298 Economic merit – Urban and Rural GDP estimation from GIS Urban Sprawl Analytics

2.299 GIS Weather Analytics (Windy.com layers for wind,rain,temperature as inputs to drone natural obstacle avoidance algorithm) and Image grayscale inversion for the non-urban (rural) complement of urban night time lights

2.300 Large Scale Visuals Streaming NoSQL Datastore (MongoDB-GridFS) support in Streaming_AbstractGenerator Facade

2.301 GIS Urban Sprawl Analytics - Moments,Centroid,Minimum Enclosing Circle of an urban sprawl

2.302 GIS Urban Sprawl Analytics - Population Estimator from Urban Sprawl Contours - usecase comparative study of few urban sprawl growth pattern examples

2.303 GIS Weather Analytics and Climate Analytics

(Tensorflow Sequential model for climate datasets, historic extreme weather events and correlation to celestial n-body choreography patterns) from OpenWeatherMap PyOWM and ECMWF CliMetLab

2.304 GIS Urban Sprawl Analytics - a Multiple Agent Resource Allocation DNFSAT Algorithm

2.305 GIS Analytics - MongoDB GridFS backend standalone python client implementation

2.306 GIS Urban Sprawl Analytics - Urban Sprawl Extent from NASA SEDAC 2015 GPW 4 Population Count and SEDAC 2020 GPW 4.11 Population Density by contour, convex hull segmentation and minimum enclosing circles

2.307 GIS Urban Sprawl Analytics - Voronoi Tessellation Clustering Diagram implementation engulfing urban sprawl contours and minimum enclosing circles – a

rural + urban extent estimator - alternative to neural network and DBSCAN urban extent models

2.308 GIS Urban Sprawl Analytics - Centrality Measures of Urban Sprawl Facegraph

2.309 GIS Urban Sprawl Analytics - Delaunay Triangulation plot – approximation of transportation network between urban areas – an Eulerian circuit and Hamiltonian estimator for Efficient Drone navigation

2.310 GIS Urban Sprawl Analytics - Distance similarity of Voronoi Tessellations (Earth mover distance, Graph Edit Distance, Modularity – community detection) and Measuring Urban Expansion

2.311 GIS Urban Sprawl Analytics - Computation of Urbanization Correlation from Voronoi Shapely Polygon areas (Rural + Urban) and Urban Sprawl Contour areas

2.312 People Analytics - Merit of Large Scale Visuals

– Unique identification - Topological Face Recognition - Voronoi Tessellation and Delaunay Triangulation of Faces, their Morphology and Shape Grammar

2.313 People Analytics - Merit of Large Scale Visuals **–** Unique identification - Topological Face Recognition - Distance similarity between Facial Image Voronoi Tessellations of similar Faces and Facial Landmark Detection **–** Wasserstein distance between Voronoi Facet Shapely polygon areas of 2 facial images

2.314 People Analytics - Merit of Large Scale Visuals - Unique identification - Topological Face Recognition - Voronoi diagram and Delaunay Triangulation of Facial images from 68-landmark centroids computed by Dlib face landmarks detection

2.315 People Analytics **–** Merit of Large Scale Visuals **–** Unique identification **–** Topological Face Recognition -

Netrd Voronoi Facegraph Graph matching distance similarity measures, Histogram partition distance similarity (cv2.EMD()) and Voronoi FaceGraph Isomorphism-Subgraph Isomorphism Similarity (NetworkX) of 2 facial images

2.316 People Analytics - Merit of Large Scale Visuals - Topological Face Recognition - Voronoi diagram and Delaunay Triangulation of Facial images from centroids computed by Dlib face landmarks detection and Voronoi FaceGraph Isomorphism-Subgraph Isomorphism Similarity

2.317 People Analytics - Merit of Large Scale Visuals - Topological Face Recognition - Voronoi FaceGraph Isomorphism-Subgraph Isomorphism Similarity - VF2 and ISMAGS Isomorphic Subgraphs iteration

2.318 People Analytics - Merit of Large Scale Visuals - Topological and Graph Theoretic Face Recognition -

Voronoi FaceGraph Isomorphism Similarity - Percentage similarity

2.319 People Analytics - Merit of Large Scale Visuals - Topological and Graph Theoretic Face Recognition - Delaunay Triangulation Mesh isomorphism and Euler Characteristic

2.320 Software Analytics – Cybercrime analytics - Graph Isomorphism Similarity of Code Callgraphs and Control Flow Graphs - Spark 3.0.1 + Python 3.7.5

2.321 Software Analytics – Cybercrime analytics - Approximate Graph Isomorphism Similarity of Code Callgraphs and Control Flow Graphs - Spark 3.0.1 + Python 3.7.5

2.322 GIS Analytics - DBSCAN Density Clustering implementation

2.323 Software Analytics - Degree Sequence Earth

Mover Distance Similarity of Code Callgraphs and Control Flow Graphs - Spark 3.0.1 + Python 3.7.5

Bipartite Social Networks (Matrimonial portals, Employer-Employee Professional networks) - Recommender Systems and Sentiment Analysis of Profiles for Ranking Preferences

2.329 GIS Urban Sprawl Analytics - Population Density computation from Contour Pixel color coding

2.330 GIS Urban Sprawl Analytics - Population count computation from HRSL Map Legend

2.331 Economic merit - Neuro Cryptocurrency mint - Commodity linked Neuro Fictitious Cryptocurrency Proof of Work Algorithm

2.332 Computational Geometric Integer Factorization - 20523 bits quadcore benchmarks - Factorization as a non-trivial Proof of Work computation for Neuro Cryptocurrency mining rig

2.333 Set Partition Analytics - Set Partition-

Rectangular Area to Factorization reduction and Integer Linear Program solution of Frobenius Coin Diophantines for Neuro Cryptocurrency mining rig Proof of Work, One Time Password facility augmented for Voter Received Encrypted Paper Audit Trail (VREPAT) Conceptual Drone Electronic Voting Machine

2.335 Fictitious Neuro Cryptocurrency Mining Rig - Random Integer Partition + Rectangular Area Factorization + Money Changing Problem Proof of Work - Digital Watermarking implementation for Visual Neuro cryptocurrency

2.336 Music Synthesizer - Python 3.8 upgrade and Fractal implementation

2.337 Music similarity - Dynamic Time Warping Waveform Distance algorithm implementation

2.338 Music Information Retrieval (MIR) - Learning a

polynomial from music waveform

Integer Factorization

Growth Model implementation for 4-colored Urban Sprawl Contour Segment Facegraphs

2.350 People Analytics - Social Network Analysis - CoronaVirus2019 analyzer - Recomputed Spearman, Kendall Tau, Pearson Correlation coefficients for revised COVID19 dataset (Lancet,WHO estimates) and corrections to Verhulste-Pearl-Reed and May Logistic code in R   - in GRAFIT repositories

2.351 GIS Analytics – Archaeology - an archaeoastronomical and computer vision analysis of MODIS GIS image of Adam's Bridge (Ram Sethu)

2.352 Merit of Large Scale Visuals - Face recognition by Approximate Topological Match of GMSH Quadmesh images

2.353 Merit of Large Scale Visuals – Archaeology - ImageNet predictions from multiple models - Rebus

Topological Script Recognition - Dholavira Signboard example deciphered by ResNet50 and ResNet50V2

2.354 Merit of Large Scale Visuals - Astronomy Analytics - DBSCAN Clustering and Segmentation analysis of sky imageries for 2 high magnitude seismic events

2.355 Merit of Large Scale Visuals - Archaeology - Rebus Decipherment of Indus Unicorn Seals and their validation by extracting common subgraphs in ImageNet predictions textgraphs (GSpan Frequent Subgraph Mining algorithm)

2.356 Merit of Large Scale Visuals - GIS Urban Sprawl Analytics - Automatic Delineation of Urban Growth Boundaries from Transportation Network GIS - KMeans Clustering of Contour Polynomials

2.357 Computational Geometric Factorization - Quadcore benchmarks - Spark 3.0.1 + Python 3.7.x -

Nanoseconds perf counter

Ephemeris Search - Longitude-Latitude and AstroPy support

2.370 Astronomy Dataset Analytics - Angular separation of solar system planets during Extreme Weather Events on Earth - an N-Body gravitational pull correlation study

2.371 Majority Voting Versus Query complexity model of Intrinsic Merit of Texts-Audio-Video-People – all implementations of Intrinsic Merit compute Merit() function by queries

2.372 Astronomy Dataset Analytics - NASA JPL Horizons Ephemeris Lookup Service support and Hubble Ultra Deep Field imagery RGB analytics

2.373 Astronomy Dataset Analytics - Computation of N-Body Gravitational Acceleration for Solar System bodies on days of Extreme Weather Events (Earthquakes and

Hurricanes)

2.374 Astronomy and Cosmology Datasets Analytics - Hubble eXtreme Deep Field imagery RGB analysis and Distance similarity of N-Body gravitational accelerations

2.375 Astronomy and Cosmology Datasets Analytics - Wilkinson Microwave Anisotropy Probe-Cosmic Microwave Background (WMAP CMB) and N-Body gravitational accelerations from arbitrary vantage points

2.376 NeuronRainApps - Wikipedia Textgraph Question-Answering Bot - WordNet Walk on answer textgraph

2.377 Economic Merit and People Analytics - Mechanism Design of Multiround Majority Voting derived from Simultaneous Ascending Auction – for Drone EVM usecase implementation in NeuronRain

Obstacle Lattice from LIDAR Point Cloud Data – Python and C++ lattice walk obstacle avoidance usecases

2.399 Astronomy and Cosmology Datasets Analytics - Solar system N-Body Pairwise angular separations computed for NOAA HURDAT2 (1851-2012) North Atlantic Hurricanes Datasets

2.400 Computational Geometric Integer Factorization - Multiple Integers - Python 3.10.4 upgrade + Spark 3.0.1 Quadcore Benchmarks

2.401 GIS Weather Analytics and Climate Analytics – NASA JPL DE421 Ephemeris N-Body analytics integration and correlation to extreme weather events – Syzygies and angular separations of Solar system bodies

2.402 Computational Geometric Integer Factorization - Multiple Integers - Python 3.10.4 upgrade + Spark 3.0.1 Quadcore Benchmarks - Numba JIT optimization - Configurable number of factors - Factorization-SquareRoot-Primality of Consecutive integers

Semiprime Factorization

timeseries data (including Music, Medical Imageing-ECG, Meteorology-Precipitation, Seismology-Tremors, NBody Gravitational Accelerations, Economics-Financial Markets)

2.412 GIS Urban Sprawl Analytics - Urban Sprawl Road Network Graph from OpenStreetMap (OSMnx)

2.413 GIS Urban Sprawl Analytics - Urban Sprawl Road Network Analytics (OSMnx) based delineation for periurban sprawl of Chennai Metropolitan Area – Road density measures and Cheeger constant - a case study

2.414 GIS Weather Analytics and Climate Analytics - MFDFA model of precipitation

2.415 Intrinsic Merit of Music - MFDFA model of Music Waveforms and Piano notes string generation from mathematical functions

2.416 Computational Geometric Integer Factorization - Python 3.10.6 + Spark 3.3.0 Quadcore Benchmarks -

Optional Square Root Optimization, Refactoring of Multiple Integer Factorization, Linux Pollard-Rho Factor Command Benchmarks comparison

2.417 Computational Geometric Integer Factorization - Python 3.10.6 + Spark 3.3.0 Quadcore Benchmarks - Multiple Consecutive Integers

2.418 GIS Weather Analytics and Climate Analytics - Prediction of Extreme Weather Events based on angular separations-NBody gravitational accelerations of few more pairs of solar system bodies from Sequence Mining and Graphics plot of Gravities

2.419 GIS Weather Analytics and Climate Analytics - Prediction of Extreme Weather Events based on angular separations-NBody gravitational accelerations of solar system bodies from Sequence Mining - Python3.x upgrade of Sequence Mining (NeuronRain Green and Antariksh -

GitHub and GitLab) and JSON persistence in NeuronRain Research (SourceForge)

2.420 GIS Weather Analytics and Climate Analytics - Prediction of Extreme Weather Events based on angular separations-NBody gravitational accelerations of solar system bodies from Sequence Mining - Arbitrary Celestial Conjunctions and Reading Sequence mined Class Association Rules from JSON

2.421 GIS Urban Sprawl Analytics - Overlay of GHSL R2022A BUILT-V Visualization and Chennai Metropolitan Area Map and its clustering

2.422 GIS Urban Sprawl Analytics - Overlay of GHSL R2022A BUILT-V Visualization and Chennai Metropolitan Area Map and its DBSCAN clustering

2.423 GIS Weather Analytics and Climate Analytics - Prediction of Extreme Weather Events from Gaussian

Mixture Model - Multimodal Gaussian fit of the precipitation timeseries

2.424 Computational Geometric Integer Factorization - Python 3.7.5 + Spark 3.3.0 Quadcore Benchmarks - Linux Elliptic Curve Factorization gmp-ecm comparison

2.425 Computational Geometric Integer Factorization - Python 3.7.5 + Spark 3.3.0 Quadcore Benchmarks - Linux General Number Field Sieve Factorization (CADO-NFS) comparisons (multiple permutations and combinations of integers)

2.426 GIS Weather Analytics and Climate Analytics - Prediction of Extreme Weather Events from Gaussian Mixture Model - Multimodal Gaussian fit of the precipitation timeseries - Modes set from N-Body gravitations

2.427 GIS Weather Analytics and Climate Analytics -

Prediction of Extreme Weather Events from Gaussian Mixture Model - Multimodal Gaussian fit of the precipitation timeseries - Gaussian Ensemble Rainfall Forecast from Timeseries Partition Enumeration

Chennai Metropolitan Area Map – a road network density analysis of expanded Chennai Metropolitan Area sprawl and mystery boom in class 21 pixel periurban regions of GHSL R2022A.

2.431 Computational Geometric Integer Factorization - Python 3.7.5 + Spark 3.3.0 Quadcore 4093 bits Benchmarks - Self Initializing Quadratic Sieve Factorization and Elliptic Curve Method (SIQS + ECM) comparison

2.432 String Analytics and Intrinsic Merit of Music - Fisher-Yates-Knuth Shuffle - permutation catalog of all possible music waveforms – Mersenne Twister PRNG

2.433 String Analytics and Intrinsic Merit of Music - Fisher-Yates-Knuth Shuffle augmented by Reservoir sampling - permutation catalog of all possible music waveforms – Reservoir sampling function implemented in

C++ is a multipurpose Opinion mining utility for approximating majority voting on a population (Opinion polls in psephology approximate majority gate or compress a majority gate by sampling a fraction of leaves)

2.434 String Analytics – Variable value swap by XOR swap algorithm - Multiple return values within a Go function, Goroutines and Gochannels for synchronization

2.435 String Analytics - String reversals by XOR swap algorithm - definition of separate Go function for reversing a string by XOR swap

2.435 String Analytics and Large Scale Visuals Analytics - Python 3.11 Matrix mirror utility primitive – String mirroring or String topological inversion

2.436 String Analytics and Large Scale Visual Analytics - Python 3.11 String Factorization - Vowelless

text compression as a consonant-vowel vectors Matrix product

2.437 Rasterization or rectification of hyperbolic arc and Factor point location in Rust- Sequential version and iterative binary search

2.438 Computational Geometric Factorization - Rayon Parallel iterator Rasterization or rectification of hyperbolic arc and Factor point location in Rust- Sequential and Parallel versions – a high performance supercomputing (Nick class) alternative to PySpark cloud Computational Geometric Factorization (DMRC MapReduce)

AstroInfer is the userspace Big Data Mining and Deep Learning facet of NeuronRain. Initially implemented for mining patterns in astronomical datasets(degrees of astronomical objects viz planets, constellations etc.,) and

prediction based on rules and execution of those rules (SourceForge), has been generalized for any dataset (GitHub,GitLab). It is also used in USBmd and VIRGO codebases below for traffic analytics and kernel analytics. Design started in May 2003.

(Latest NeuronRain AsFer research version Code at sourceforge repository: http://asfer.sourceforge.net and periodically updated Design Details at: http://sourceforge.net/p/asfer/code/HEAD/tree/asfer-docs/AstroInferDesign.txt)

(Latest NeuronRain AsFer enterprise version Code at github repository: https://github.com/shrinivaasanka/asfer-github-code and periodically updated Design Details at:https://github.com/shrinivaasanka/asfer-github-code/blob/master/asfer-docs/AstroInferDesign.txt)

3. NEURONRAIN - VIRGO – VIRtual Generic Os Linux

Kernel (compatible with 4.1.5 (32-bit) and 4.13.3 (64-bit)

mainline kernels) – Linux Kernel Extensions for cloud -

kernel modules, system calls for cloud rather than at

application level high up the stack with :

    3.243   Config file support

    3.244   Psuedorandom Generator Based

Loadbalancer

    3.245   Kernel space remote execution

    3.246   User space remote execution with kernel

upcall and pthread creation of userspace library function

or executable

3.252　　　　　　　Queueing Driver - that implements a wrapper over linux concurrent managed workqueue (CMWQ) and also a native local queue - used for KingCobra requests queuing with handler invocation. Also implemented is a standalone kernel queueing service that listens on requests rather than being forwarded by CPU and Memory pooling drivers above.

3.253　　　　　　　VIRGO Cloud File Systems Driver and system calls - implements distributed cloud file system calls and telnet userspace clients for – virgo_open, virgo_close, virgo_read and virgo_write of a file on remote cloud node

3.254　　　　All the drivers above for CPU, Memory and File System on cloud have 3 paths each for telnet connection to remote driver kernel server socket and system call connection to remote driver kernel server

socket – 1) parameter is executable in userspace 2) parameter is a function name which uses a kernel upcall plugin to execute in userspace 3) parameter is a function name executable in kernel space – configured by a boolean flag with in the driver binaries. Based on this flag either kernel upcall to userspace or kernel intermodule invocation is done.

3.255   A config driver - for exporting config symbols

3.256   Experimental Bakery algorithm kernel module implementation – for synchronization in cloud

3.257   Utilities driver kernel module – a universal kernel module with exported utility function symbols that can be invoked across VIRGO Linux subsystems and Linux kernel including EvenNet logging kernel socket client and skbuff kernel socket debugger.

3.258	Experimental EventNet driver kernel service module – This listens on incoming EventNet log messages (Vertex and Edge) and writes to EventNet Vertex and Edge text files by VFS write. These files can then be massively processed by the boost::graph or pygraph GraphViz code in AsFer to create DOT files and graphics. Event vertices and edges can be logged by virgo_eventnet_log() utility function from any kernel module on any VIRGO cloud node.

3.259	From the above EventNet graph, a logical time ordering can be obtained on the cloud events and partakers which is for example useful in establishing money trail in KingCobra MAC eletronic money.

3.260	Kernel Analytics Kernel Module – reads the config key-value pairs set by AsFer or any other machine learning software and exports them which can

be looked-up in any other kernel module. The key-value config are analytics variables learnt by mining kernel or other logs and objects. With this an adaptive dynamic kernel which changes over a period of time depending on a machine learnt config is obtained. At present an Apache Spark usecase which mines kern.log and exports a config variable through kernel_analytics has been implemented.

3.261   Thus VIRGO has all the requisite minimum functionalities for a linux variant cloud, artificially intelligent, operating system

3.262   SATURN Program Analysis Module – Intercepts linux build and extracts program analysis data in trees. SATURN logs are analyzable by AsFer (e.g null pointers, aliasing, memory etc.,).

3.263   VIRGO is suitable for analytics driven embedded systems e.g kernelspace IoT

3.264   VIRGO KTLS config kernel module – only in VIRGO_KTLS branch of VIRGO64 repositories

3.265   64 bit version of VIRGO Linux kernel based on mainline 4.13.3 kernel (in a separate repository) is in separate repository and has been found to be better performing and stabler than VIRGO 32bit.

3.266   VIRGO 64-bit has lot of random panics related resolutions related mostly to i915, CIFS drivers and SMB security. Though functionally similar to 32 bit VIRGO linux, 64 bit kernel is suited for large RAM installations, with CPU level security features and faster than 32 bit binaries. 4.13.3 kernel also supports Kernel Transport Layer Security (KTLS). VIRGO64 repositories implement KTLS setsockopt() in a separate branch – VIRGO_KTLS.

3.267   Streaming kernel analytics in VIRGO64 – for

live reading of stream of analytic variable-value pairs from remote cloud node over network in kernel_analytics module and exporting them as global symbols in local cloud node kernel. Requires a webservice creating a stream of key-value analytics learnt from a dataset. Presently implemented only in VIRGO64

3.268 Kernel Analytics powered PXRC Flight Controller Driver – Kernel support pxrc flight controller driver from 4.17. Changed PXRC driver in kernel 5.1.4 has been committed to VIRGO64 repositories which imports kernel analytics variables exported by kernel_analytics driver in VIRGO64.

3.269 Kernel Analytics powered UVC Video Driver – Changed UVC Video driver in kernel 5.1.4 has been committed to VIRGO64 repositories which imports kernel analytics variables exported by kernel_analytics driver in

VIRGO64.

3.270 Read-Copy-Update in userspace - usecase (in GRAFIT) – wraps VIRGO System calls

3.271 Software Transactional Memory in userspace – Lockfree datastructures – usecase (in GRAFIT) – wraps VIRGO system calls

VIRGO enables viewing entire cloud as a single "logical machine" upto hardware level with machine learning support by implementing lowlevel primitives that can be invoked by highlevel cloud OS components viz., OpenStack Neutron. This differentiates from other cloud libraries which are in userspace mostly. AstroInfer together with KernelAnalytics-VIRGO-USBmd-KingCobra make it a Cloud OS kernel with Machine Learning and Analytics abilities. Support for mobile operating systems

in cloud are, among other things, long term goals for VIRGO.

(Latest NeuronRain VIRGO research version Code at sourceforge repositories: https://sourceforge.net/projects/virgo-linux/ , https://sourceforge.net/projects/virgo64-linux/ and periodically updated Design details at:

https://sourceforge.net/p/virgo64-linux/code/ci/master/tree/virgo-docs/VirgoDesign.txt , http://sourceforge.net/p/virgo-linux/code-0/HEAD/tree/trunk/virgo-docs/VirgoDesign.txt)

(Latest NeuronRain VIRGO enterprise version Code at github repositories: VIRGO –

https://github.com/shrinivaasanka/virgo-linux-github-code ,

https://github.com/shrinivaasanka/virgo64-linux-github-code and periodically updated Design details at:

https://github.com/shrinivaasanka/virgo64-linux-github-code/blob/master/virgo-docs/VirgoDesign.txt,

https://github.com/shrinivaasanka/virgo-linux-github-code/blob/master/virgo-docs/VirgoDesign.txt)

Design started in 2008.

4. NEURONRAIN - USBmd- Linux kernel USB device driver module for debugging and network analytics :

4.272 Contains a modified version of Linux kernel mainline USB and USBWWAN broadband modem drivers with debug statements and functions that capture and dump data transfer buffers in kern.logs.

4.273 These logs are parsed and processed with Apache Spark and other AsFer machine learning algorithms (e.g Streaming Algorithm implementations) to create a debug and traffic analytics for in and out data – a typical software analytics usecase with widespread necessity in anti-cybercrime, anti-theft and anti-virus

products

4.274 Mainline USB drivers (USBWWAN, USB serial, USB storage) instrumented with debug statements in URB related functions

4.275 Apache Spark Python MapReduce Log Analyzer for kern.log – extracts patterns in USB requests and wireless LAN traffic. By enabling Kernel Address Sanitizer in linux kernel 4.10.3 64 bit code and Spark ETL, USB related kernel function invocations have been profiled.

4.276 64-bit version of this driver is in separate repository based on 4.13.3 mainline linux kernel (32-bit version is based on mainline kernel 4.1.5)

4.277 USBmon and Ftrace kernel utility support for analyzing USB interface traffic and kernel functions invocation graph logs

4.278 This USB analyzer complements the Program

Analysis - Software Analytics module in AstroInfer (for userspace applications) analyzing kernelspace function call graph and network activity among others

4.279 tcpdump and wireshark pcap format WLAN logs can also be analyzed by Spark Analyzer for regular expression patterns

4.280 Ftrace kernel function call graphs are written to a DOT file and analyzable by any Subgraph Miner

4.281 Ftrace call graphs have been analyzed by NetworkX for PageRank and Degree Centrality measures which provide insight into most active code in kernel for an executable

(Latest NeuronRain USBmd research version Code at sourceforge repositories: https://sourceforge.net/p/usb-md/ , https://sourceforge.net/p/usb-md64/code/ci/master/tree/ and

periodically updated Design Details at:

https://sourceforge.net/p/usb-md64/code/ci/master/tree/USBmd_notes.txt,

http://sourceforge.net/p/usb-md/code-0/HEAD/tree/

USBmd_notes.txt)

(Latest NeuronRain USBmd enterprise version Code at

github repositories: https://github.com/shrinivaasanka/usb-md-linux-

github-code , https://github.com/shrinivaasanka/usb-md64-github-code

 and periodically updated Design Details at:

https://github.com/shrinivaasanka/virgo-linux-github-code/bl

ob/master/USBmd_notes.txt ,

https://github.com/shrinivaasanka/usb-md64-github-code/blo

b/master/USBmd_notes.txt).

5. NEURONRAIN - King Cobra – Kernelspace Messaging

and Computational Economics Software   that includes a new fictitious Electronic Message Currency – Neuro – which depends on Google Protocol Buffer based Cloud Object Move functionality in AsFer. Flow of such a fictional currency on AsFer EventNet implementation (actors in event vertices are buyers/sellers and direction of flow determines buy/sell) can simulate Economic Markets and Pricing. EventNet is thus equivalent to hyperledgering in other cryptocurrencies and can capture money trail.

(NeuronRain KingCobra research version sourceforge Repositories - https://sourceforge.net/p/kcobra/ , https://sourceforge.net/projects/kcobra64/ and periodically updated design notes at https://sourceforge.net/p/kcobra64/code/ci/master/tree/KingCobraDesignNotes.txt, https://sourceforge.net/p/kcobra/code-svn/KingCobraDesignNotes.txt)

(NeuronRain KingCobra enterprise version sourceforge

Repositories - https://github.com/shrinivaasanka/kingcobra-github-code ,

https://github.com/shrinivaasanka/kingcobra64-github-code and

periodically updated design notes at

https://github.com/shrinivaasanka/kingcobra64-github-code/

blob/master/KingCobraDesignNotes.txt, https://github.com/

shrinivaasanka/kingcobra-github-code/blob/master/

KingCobraDesignNotes.txt)

Implements a minimal kernelspace and userspace

messaging framework using VIRGO cpupooling

(virgo_clone) and memory pooling drivers that in turn

queues the requests into a kernel workqueue. There is

also a standalone VIRGO queue kernel service that listens

on the requests without dependencies on VIRGO

cpupooling and memorypooling drivers to forward the

requests. The VIRGO workqueue handler pops the request

from workqueue and invokes KingCobra driver's servicerequest exported function and replies to the publisher and optionally disk persists the incoming requests to filesystem through VFS. Differentiator is KingCobra implements a cloud messaging with a decentralized queue with disk persistence and workflow in kernel level so that hardware is easily integrated into cloud:

5.282 Linux Kernel workqueue based kernelspace pub-sub kernel module - Receives Messages from VIRGO Queuing

5.283 Atomic Cloud Move for Neuro (Message As Currency) electronic money is implemented In AsFer in C++ client-server perfect forwarding (overloaded std::move() and std::forward())

5.284 Userspace JMS pub-sub client-server

5.285 Pricing – CVXPY implementation - Eisenberg-Gale Market Equilibrium Convex Optimization for finding Market Clearing Prices for Goods and Services. Replacing Prices by Perceived Merit translates Market Equilibrium to Intrinsic Merit Versus Perceived Ranking Equilibrium.

5.286 Disk persistence of Request-Reply queues.

5.287 64-bit version of this driver is in separate repository based on 4.13.3 mainline linux kernel (32-bit version is based on mainline kernel 4.1.5)

5.288 Fictitious Neuro currency Buy-Sell transactions are edges in an EventNet Event-Actor Graph implemented in AsFer and can be mined for subgraph patterns – EventNet is thus an economic network

5.334 Algorithmic Trading in Fictitious Neuro Cryptocurrency - EventNet Graphical Event Model (GEM) HyperLedger implementation

6. NEURONRAIN - acadpdrafts - All publications and drafts with code (along with important documents and Photo ID proofs) are uploaded at

http://sourceforge.net/projects/acadpdrafts/

The opensource codebases above are nonprofit academic research efforts. Premium Technical Support for above opensource codebases available. Premium Dual licensed Closedsource products derived from codebases in:

https://github.com/shrinivaasanka, https://gitlab.com/shrinivaasanka and https://sourceforge.net/u/userid-769929/profile/ are in development since 2010.

7. NeuronRain GRAFIT Open Learning :

https://github.com/shrinivaasanka/Grafit/tree/master/course_

material, https://gitlab.com/shrinivaasanka/Grafit,

https://sourceforge.net/u/userid-769929/Grafit/ci/master/tree

/ – May 2010 – Present – Free online courses based on

NeuronRain codebases and Design Documents,

Puzzles/Questions from Competitive examinations and miscellaneous topics – non-linear material focusing on Bigdata, Problem solving, Machine Learning, Fundamentals, Programming – Creative Commons 4.0 NCND licensed - includes spillover implementations of other NeuronRain repositories:

Virtual Classroom -

https://classroom.github.com/classrooms/8086998-https-github-com-shrinivaasanka-grafit

HAMSA – NeuronRain Lectures, Audio-Visuals related to NeuronRain repositories, Theory and Miscellaneous – https://kuja27.blogspot.com

GRAFIT course materials (in .zip) are available from Moodle GRAFIT website - https://moodle.org/pluginfile.php/4765687/user/private/Grafit-master.zip?forcedownload=1

BRIHASPATHI - Private Online Virtual Classrooms

Private repositories of virtual classrooms for various commercial online courses (BigData, Machine Learning, Topics in Mathematics and Computer Science,...) - https://github.com/Brihaspathi - requires GitHub student logins

April 2015 – September 2015 - CloudEnablers - CusDelight - Corestack, Chennai – Architect

1. Design and PoC implementation in python for translating Topology Orchestration Specification for Cloud

Applications (TOSCA) XML BPMN Plan Models to Stackforge/Mistral Workflow YAML (Mistral-translator - similar to Heat-translator project for Simple TOSCA YAML to Heat Orchestration Templates)

2. Design and PoC implementation in python for Jinja2 rendering template feature addition to TOSCA Plan XML and Mistral YAML based on JSON context for conditionals and control structures support

3. Creating a Capability matrix of different Cloud Orchestration and template softwares: AWS,Heat,Mistral,Puppet,Chef,Ansible,Saltstack,Twisted,Nunjucks

4. Study of OpenTOSCA implementation of TOSCA (University of Stuttgart) and feasibility of its integration into Corestack (Cloudenablers)

5. Feasibility study of new features to Mistral Workflow

Engine Parser (if-else,nested for-each,with-items,concurrency)

6. Feasibility of Apache Brooklyn CAMP blueprints based cloud application deployment

7. Design and PoC Development of Service Dynamic Data Discovery, MetaData and Actions REST API, Cloud Federation and Abstraction Layer (for abstracting providers, federated clouds and multiclouds like ComputeNext, Libcloud, Jclouds, Dasein, AWS etc.,) for provider abstraction and Directory Service REST API

8. Corestack code review

9. Study of feasibility of Jclouds integration into corestack

10. Design and PoC for Process Checkpoint and Restoration with CRIU in baremetal, VMs and Docker (with overlay and aufs union mount filesystems). Docker public repository -

https://hub.docker.com/r/srinivasankannan/cloud-migration/

11. Design and PoC sync scripts implementation for Automated VM image synchronization with bup, rsync, lsyncd-lua and inotifywait (inotify-tools).

12. Design and PoC implementation for Service Discovery through above REST API and migrating them with Jinja2 Heat and Mistral YAML templates extraction and Performance tunables for cloud.

June 2014 – July 2014 – Clockwork Interviews Pvt Ltd, Chennai (Hiring product - http://piqube.com) – Consultancy on Design and a Java based minimal Implementation for computing the various statistical measures from a job experience sequence: 1) Stability or predictability of job experience sequence using Shannon

Entropy and Inversion number, 2) Estimating various types of average experience metrics, 3) Mobility scoring, 4) Initial work on Skills based clustering of linkedin profiles using String similarity and 5) Initial Hidden Markov Model design for job change motivation inference

February 2014 – Clockwork Interviews Pvt Ltd, Chennai (Hiring product - http://piqube.com) – In-office non-profit Consultancy to PiQube for initial design of a Multivariate Linear Regression model for Stability and Gap scoring in Resume that includes entropy independent variables using ENT sequence disorder measure, study of various tools (including Stanford CoreNLP - Classifiers and Recursive Tensor Neural Network Sentiment Analysis

Tools) for Sentiment Analysis of a Resume and Holistic Resume scoring model using social network analysis from multiple datasources

October 2013 – January 2014 – continued work on my opensource products (Krishna iResearch - https://sourceforge.net/users/ka_shrinivaasan) and non-profit machine learning remote consultancy to Clockwork Interviews Pvt Ltd, Chennai (Hiring product - http://piqube.com) for initial design of a Resume scoring, Named Entity Recognition in Resume using GATE, CRF++, IIT-Bombay CRF, study of Social Network Analysis Tools (SocVnet,SNAP etc.,) and informal mail interactions on my open source products among other things

September 2012 - February 2013 – Parttime Consultancy for Global Analytics(Chennai) and Work on my opensource products (Krishna iResearch)

1. Did the Python AMP workflow implementation as per the workflow specification for AMP using PyUtilib, RabbitMQ and Config files support. Wrote some python scripts for AMP workflow config files support and parsing.

2. Wrote Design spec analyzing workflow alternatives (like PyF, cascade) .

3. Wrote AMP workflow-over-cloud (AMP on Hadoop) specification in addition to AMP workflow spec.

4. Guided on GDP 2.7.x and 3.0 bug fixes and issues.

5. Helped in debugging GDP 3.0 timeout manager implementation in Feb 2013 which was found to be working.

Apart from the above worked on design and development of my nonprofit open source products-

https://sourceforge.net/users/ka_shrinivaasan

January 2011 – March 2011 and July 2011 – August 2012 – Global Analytics(Chennai) – Senior Lead Software Architect (C/C++/Python)

1. Mentored and Managed a team of 3 people .

2. Released version 2.3.1 of Global Decision Platform(GDP) with fixes for crashes in production environment.

3. Did refactoring, many bug fixes and enhancements to Global Decision Platform(GDP) version 2.5.0 for master demo lead passthroughs to work.

4. Implemented acceptor-worker thread model request handling in GDP 2.5.0 with single acceptor thread and configurable number of worker threads for Service Execution Manager(SEM) and Service components of GDP. This resulted in significant improvement in response time.

5. Designed and implemented session based request-response in GDP 2.5.0

6. Implemented modified timeout error logging with placeholders for errorcodes and request id and did fixes for frequent crashes in production environment for GDP 2.5.0.

7. Released GDP version 2.5.1 for which 2 minor binaries were developed to clear the queue and test the creation of queues (for System V message queues)

8. Released GDP version 2.7 which has important bug fixes for crashes in python container(needed for AMP runtime described later), few features for graceful

shutdown of the SEM, option to reconnect to MySQL during exception in Python container etc.,

9. Redesigned GDP 2.5.0 SEM loadbalancer for GDP 3.0 to route requests to service processes by periodically monitoring the service process load and removing a bottleneck due to wait/notify code. This resulted in 10x speed up of the request-response throughput time.

10. For GDP version 3.0, designed and Implemented a new Session Timeout Manager algorithm to timeout the request session based on user configured timeout value(simplified version of Survival Index Based Transaction Timeout Manager mentioned later).

11. For GDP version 3.0, worked on embedding multiple

python interpreters in Service process with Python C API replacing boost::python calls. This involves facility to have a global dictionary across multiple interpreters (or) local dictionary per request (or) per-thread dictionary for each service worker thread (using thread local storage) and also creation of pool of interpreters from which interpreters are allocated per request and returned to the pool after the request is serviced. This obviated the need for boost::python since boost did not support multiple interpreters with multithreading and interpreter pooling. This involved fixing one of the most time consuming bug related to restricted mode python in 2.4.3. Since it was deprecated in python 2.7, fixed Python 2.4.3 source to circumvent restricted mode and also did another fix for the same problem with PyImport_ImportModuleEx()

12. Mentored the team to work on Dynamic Risk Tables (DRT) library of GDP to extend the database compatibility to MySQL and Oracle

13. Was involved in the Automated Modelling Platform(AMP) development to automate the predictive modelling from the production data. Fixed many crashes in python runtime during testing of AMP prototype realtime design. Suggested an alternative design for AMP realtime based on external user address-space message queue, which populates the in-memory queue from on-disk request log, periodically replenishes it from disk, reads requests from message queue and posts them in parallel to Realtime-subset and Realtime-superset python services, and gives a virtual view of the single physical queue to each queue client(queue clients are located in

SEM) – meant to replace an existing queueing module with msgsnd/msgrcv which involves user and kernel address-space copying to remedy huge queue backlog seen in AMP realtime prototype. This tightly couples GDP Python runtime with the AMP runtime

14. For GDP 3.0, implemented a GDP pluggable queue named GDAMPQ designed for AMP above – Global Decisioning and Automated Modeling Platform Queue which is a simple in-memory queue with optional disk persistence to replace an existing queueing module with msgsnd/msgrcv which involves user and kernel address-space copying. This in-memory queue in best testing circumstances is 30% better than the System V unix message queues.

15. Worked on Python 2.4.3 source code to analyze crashes in PyMalloc. Modified Python 2.4.3 source to add a flag DISABLEPYMALLOC to disable calls to PyMalloc and re-route them to unix malloc/free systemcalls. Also analyzed Python 2.4.3 source code for restricted mode related errors while designing multi-interpreters for GDP 3.0 and fixed them.

16. Worked on writing python configuration scripts for automating the build configuration and installation of GDP components like SEM, Service and Master .

17. Implemented a minor encrypt utility for master component of the GDP

18. Wrote Functional specification for GDP 3.0 Automated

Installer design

19. Wrote Functional specification for AMP Workflow

20. Wrote Functional specification for AMP Cloud deployment

21. Studied python workflow packages for AMP workflow viz., Pyutilib.workflow, PyF and implemented a workflow prototype for AMP workflow in Pyutilib.workflow.

22. Implemented a small prototype stub using Dumbo Mapper-reducer for Cloud
 Deployment of AMP

23. Did 2 one-week training sessions for GDP versions

24. Did one-week training session for Python.

25. Implemented a mini-GDP client and server for debugging socket related errors in production.

26. Developed a documentation knowledgebase intranet website for GDP documentation, design documents, installation troubleshooting documents and debugging documents.

27. Implemented a Build Version feature for GDP 2.7.1 and GDP 3.0 which dynamically generates a buildversion.h headerfile which contains #defines for build machine and architecture information,SVN source tree version information for the build and is built at

runtime by SEM, Service and Master binaries which include this buildversion.h header file

(In August 2012 resigned for personal reasons.)

January 2011 – March 2011 – Consultant for Global Analytics(Chennai) and Work on my opensource products (Krishna iResearch) – (C++/Python)

Worked on my Open Source Products Design & Development (Krishna iResearch) and Did consulting and development for Global Analytics,Chennai (optimization, a

smart-pointer reference-counted memory manager backed-up by an Object Pool, and refactoring) in Global Decision Platform (GDP) 2.3 for GPD 2.3.1 and 2.5 which is written in C++ with boost::python embedding.

August 2008 – June 2011 – Work on my opensource products (Krishna iResearch)

Started working on open source project ASFER (http://asfer.sourceforge.net) as part of my non-profit open source initiative Krishna iResearch – ASFER is a rule miner and executer- presently uses Vector space retrieval and Support Vector Machines with added Support for Naive Bayesian Multinomial Classifier and Decision Tree Classifier

March 2006 – July 2008 - webMethods and webMethods (now Software AG) (Bangalore) (C/C++/Java)

Worked on WebMethods Broker Server 5.x/6.x/7.x– a heavily multithreaded messaging productwritten in C/C++/Java based on publisher/subscriber model – Clients can publish and/or subscribe to certain predefined types of messages called "Events". My responsibilities included development of new functionalities and fixing customer escalation issues in core areas of Broker (Connection

Layer, Territories/Gateways,Broker Admin Tool etc.,) and writing knowledgebase documents.

November 2005 – February 2006 – Krishna iResearch (self-started, not-for-profit, open-source research initiative)

Initial design work for Krishna iResearch open source products focussing on algorithms for web and BigData

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August 2005 – November 2005 – Verizon Data Services India, Chennai

In Verizon India for brief period and then self-study in Mathematics and Computer Science.

May 2003 – Krishna iResearch (self-started, not-for-profit, open-source research initiative)

Registered on SourceForge.net and Initial design work started for open source products focussing on algorithms for web and BigData

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February 2000 – July 2005 – iPlanet (Sun Microsystems-Netscape Alliance) and Sun Microsystems (now Oracle) (Bangalore)

Ported SunONE Application Server to Red Hat Enterprise Linux

Advanced Server 2.1 (2005)

Certified JWSDP 1.3 webservices pack on Sun One

Application

Server 7.1 (2005)

Studied feasibility of supporting SunOne Web/Proxy

Server on Solaris 10 zones (2005)

On Academic Sabbatical for 3 months (February 2005-

May 2005)

Implementation of a threaded ICP server and porting

SOCKS server for Sun Java system web proxy server 4.0

(C/C++/Solaris/Windows/RHELinux) (2004-2005):

Implemented a threaded ICP(Internet Cache protocol)

server functionality using NSPR threads.

Also ported a legacy SOCKS server to proxy server 4.0.

Load Balancer Module for Apache Web Server 1.3.27 /

2.0.47

(C/C++) (2003-2004) :

Designed and implemented a Load balancer module for

Apache 1.3.27 which will route the

HTTP/HTTPS requests onto SunONE Application Server

instances by Round Robin Algorithm.

This module is part of Sun ONE Application Server 7,

Enterprise Edition.Also ported the module to Apache

2.0.47.

Optimizations and Features for iPlanet/Sun ONE

Application

Server 6.x (Java) (open sourced at http://glassfish.java.net)

(2002) :

a) Fixed bugs related to performance, admin-tool and

security in iPlanet Application Server 6.x. Also fixed few CTS bugs

in SunONE Application Server 7 Standard Edition.

b) Involved in optimization of SUN J2EE Reference Implementation (RI) to make the JTS transaction manager enterprise-class. This included introducing a new Component Level Transaction Attribute setting feature in iPlanet Application Server 6.5. With this, user can set the type of transaction (XA or Local) at J2EE application component level. [Patents granted – details in the end]

c) Added a Trace functionality for the JTS transaction manager in SunONE Appserver 7.0 Enterprise Edition

(http://glassfish.sourcearchive.com/documentation/1:2ur2-

b04-1/dir_512e7fccb5ab465c594742cd72317a0e.html).

Debugging and Monitoring framework (MagicDraw) (2002)

:

Designed a Debugging and Monitoring framework for Sun

ONE

Application Server 7.0 Enterprise Edition.

Store Adapter prototype for High Availability(Java) (2002)

:

Implemented a store adapter prototype for Clustra High

Availability Database. This was to test the feasibility of

using

Clustra HADB as backend store for session data in

SunONE Application Server 7.0 Enterprise Edition.

Minor Feature Addition to SunOne Application Server 6.5 SP1 (2002)

Added support for enabling/disabling TCP_NODELAY in SunOne Application Server 6.5 SP1

Survival Index based Transaction Timeout Manager for iPlanet Application Server (Java)(2002):

Designed and implemented a new Transaction Timeout Manager for iPlanet Application Server.This resulted in an overall speed-up of 10% for the application server. (Invention Disclosure done in 2002-2003)

Miscellaneous Bugfixes for customer escalations in the BillerXpert product which was dependent on iPlanet Application Server. This was one of the most involved

bugfixes that required many days of debugging with JVM Profiling tools. (2001)

An automated Test suite for nightly build setup of iPlanet Application Server 6.0 (2001):

Designed and implemented a test suite which ran a set of regression tests on nightly builds of iPlanet Application Server - written on Korn shell.

JVM related bugfix for IBM's Java Virtual Machine team related to native thread and green thread implementations of JVM (2000)

Created a Resume Querying System using JDBC with Oracle Backend for Sun Microsystems Human Resources Department to track candidate profiles – named

ResumeXpert (2000)

Official Training Courses (SunU)

1. Solaris internals

2. Multithreaded Application development in Solaris

3. SOLARIS DEVICE DRIVER INTERNALS

July 1999 - January 2000 - BaaN Infosystems (now SSA Global) (Hyderabad)

Developed a storefront for an e-commerce application called

E-Enterprise using Microsoft Internet Information

Server/Site Server, Visual Basic, Active Server Pages and Visual Interdev

January 1999 – May 1999 – BE Thesis and Project(team) – COBRA – Distributed Computing Framework based on CORBA(Visibroker) and JAVA.

April 1998 – June 1998 – BE Internship at Steel Authority of India Limited (Raurkela and Durgapur Steel Plants) – Enhancements to Automated Furnace Data Acquisition software through a GUI developed on VAX Fortran over VAX VMS

MISCELLANEOUS

1. Gold medal for proficiency from PSG Tech for ranking first in B.E.(CSE) – Received in February 2000

2. GRE (2002) – score 2040, TOEFL - 270

3. Joint Entrance Screening Test(JEST) 2006 in Theoretical Computer Science - Rank 21 (Reg No: 22123).

4. Participated in Winter School 2010 on Machine Learning and Computer Vision, Microsoft Research & CIFAR, IISc

5. UGC Net July 2016 – 66 (I), 54 (II), 50.67 (III) (in percentage) (Roll No. 69004241)

EXTRA-CURRICULAR:

Painting, Writing, Reading non-fiction mostly on science,mathematics, religion and philosophy.

VIDEO RESUME(s):

https://github.com/shrinivaasanka/asfer-github-code/tree/master/python-src/image_pattern_mining/ImageNet/testlogs/ (ExampleVideo*mp4)

https://github.com/shrinivaasanka/Grafit/blob/master/course_material/NeuronRain/LinuxKernelAndCloud/code/testlogs/Krishna_iResearch_NeuronRain_Repositories-2020-07-10_13.17.20.mp4