

Interesting R&D Investigations Using Java Script(JS) Language & its related Software/AI & ML Libraries in the Context of Advanced Medical Image Processing/Electron Microscopy Image Processing Informatics Frameworks based on AI/ML/DL/IoT/HPC Heterogeneous Environment/s – A Simple R&D Introduction.

[Exploring – C/C++/Ruby/LLVM/GCCS/Emscripten/SWIProlog/WASM/Marvin/OpenCVJS – for Image Processing]

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[I] Inspiration & Introduction :

<https://en.wikipedia.org/wiki/JavaScript> – JavaScript Language Details in General Context.

<https://medium.com/@turalt/3-reasons-javascript-is-great-for-ai-88a52292daea>

[3 reasons JavaScript is great for AI]

<https://www.npmjs.com/package/dcmjs>

<https://www.leadtools.com>

<https://github.com/cornerstonejs/cornerstone>

https://www.w3schools.com/js/js_object_prototypes

<https://www.meteor.com>

[JavaScript for Artificial Intelligence – mind.sourceforge.net](https://mind.sourceforge.net) > ...Liaison among Open Source AI/Mind projects in artificial intelligence.

FNNDESC/ami: AMI Medical Imaging (AMI) JS ToolKit – GitHub – <https://github.com/FNNDESC/ami>

<https://medevel.com/ami-medical-imaging>

<https://www.leadtools.com/sdk/medical/html5>

https://na-mic.org/wiki/AMI:_A_3D_Medical_Imaging_Javascript_Lib..

<https://cornerstonejs.org> – Cornerstone.js – The easiest way to build interactive medical imaging web applications. Cornerstone provides a free open-source framework to build your own...

ohif.org – 3D Slicer is an open-source software platform for medical image informatics, ... for building web applications that uses meteor; a full-stack javascript platform.

<https://www.quora.com/Are-there-any-free-HTML-JS-based-DICOM-ima..>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5603437>

<https://formats.kaitai.io/dicom/javascript>

[Papaya – Research Imaging Institute – Mango](https://www.researchimaginginstitute.com/mango) – ric.uthscsa.edu/mango/papaya

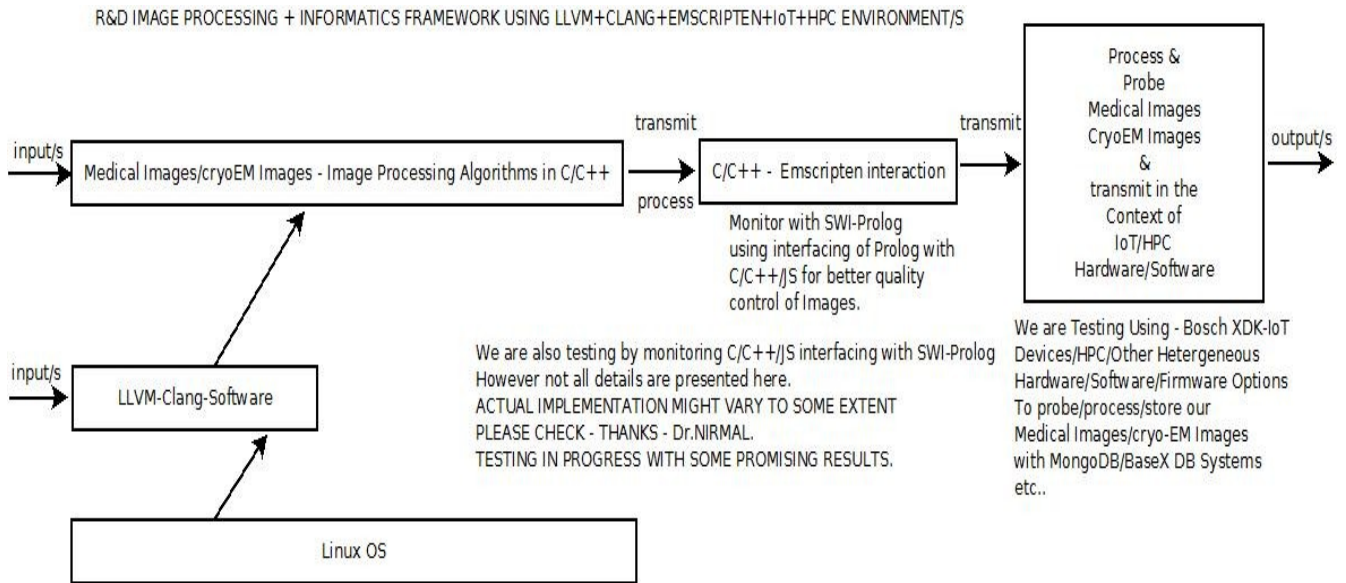
[Artificial Intelligence in JavaScript with TensorFlow.js – JavaScript ...https://www.javascript-january.com/blog/artificial-intelligence-in-javascript](https://www.javascript-january.com/blog/artificial-intelligence-in-javascript)

https://en.wikipedia.org/wiki/List_of_open-source_health_software

[www.vcl.fer.hr/papers/pdf/JavaScript Access to DICOM Network and](http://www.vcl.fer.hr/papers/pdf/JavaScript%20Access%20to%20DICOM%20Network%20and)

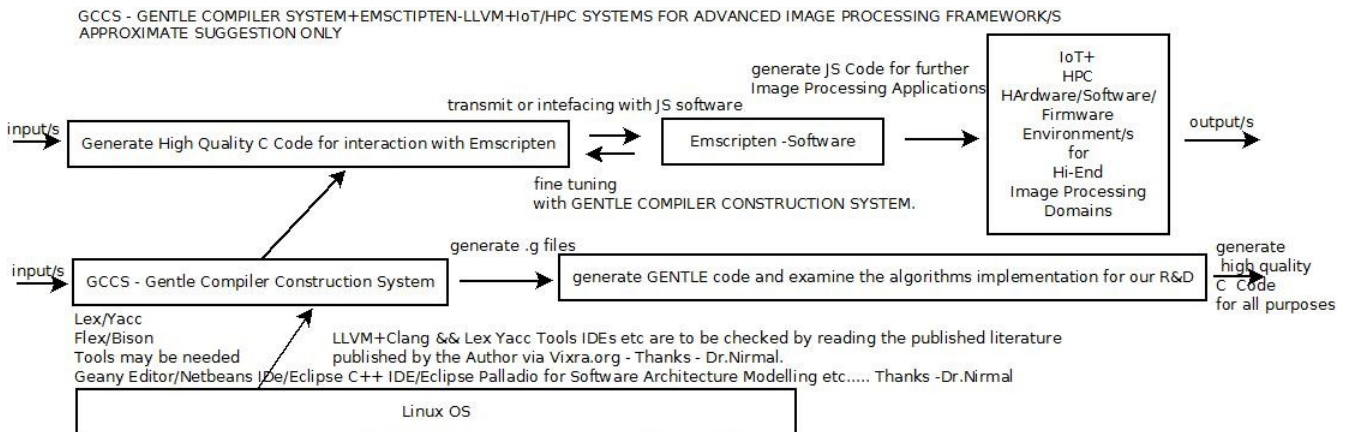
<https://dzone.com/articles/8-machine-learning-javascript-frameworks-to-e...>

[III] JavaScript based R&D (Imaging Mathematics+Image Processing+IoT/HPC) Frameworks Implementation/s :



ALGORITHM I - DESCRIPTION.

[Figure I – Algorithm I – LLVM –Emscripten Image Processing Framework Using IoT+HPC Environment/s]



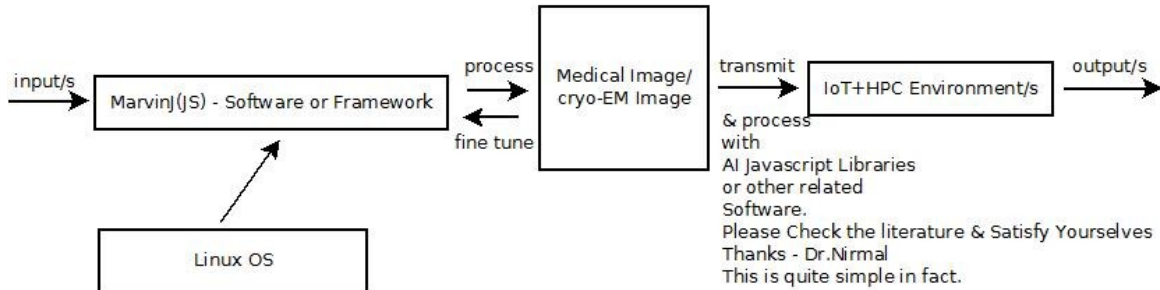
Algorithm II - GCCS-GENTLE CODE-C CODE-JS Code Using Emscripten Software in the Context of IoT/HPC Image Processing Environment/s + SWI Prolog interaction is not shown here. Please Check & Satisfy Yourselves - Actual Implementation might vary to some extent. Testing in progress with some promising results. GENTLE Compiler Construction System + Bosch XDK IoT Devices are a wonderful R&D Tools. Thanks - Dr.Nirmal

[Figure II – Algorithm II – GCCS+Emscripten+LLVM+IoT+HPC Environment/s for Advanced Image Processing Applications R&D]

*** { Some Useful Information on GCCS – Gentle Compiler Construction System for Robust R&D }

{ <http://www.vixra.org/abs/1907.0115>
<http://gentle.compilertools.net/>
gentle.compilertools.net > GENTLEg7 }

Marvinj is a pure javascript image processing framework derived from Marvin Framework.



Algorithm III - Marvinj based Image Processing with AI Option in the Context of Javascript language Useful in Testing in the IoT/HPC Heterogeneous Environment/s.

JavaScript is making huge inroads into AI/ML related domains - Hence our simple suggestion.

Extensibility is one of the core ideas behind Marvin Framework. Since there are wide variety of image processing algorithms IT IS EASY TO probe advanced Medical Image Processing/cryo-EM Image Processing tasks on hand.

[<http://vixra.org/pdf/1804.0028v1.pdf>] - by Nirmal Tej Kumar.

[Figure III – Algorithm III – Marvinj Image Processing Framework in the context of IoT+HPC Environment/s]
[<https://www.marvinj.org/en/index.html>]

“Emscripten is a source-to-source compiler that runs as a back end to the LLVM compiler and produces a subset of JavaScript known as asm.js. It can also produce WebAssembly. This allows applications and libraries originally designed to run as standard executables to be integrated into client side web applications”.

[Source : [Wikipedia](#)]

[License: MIT License/Developer\(s\):](#) Alon Zakai

[Stable release:](#) 1.38.30 / [21 March 2019](#); 5 months ago

[Written in:](#) C, C++, JavaScript

A Chest X-ray Diagnostic Tool – TensorFlow.js– Healthcare– by Joseph Paul Cohen–February 10, 2019

[Source : <https://aijs.rocks/?ref=webdesignernews.com>]

“Deeplearn.js is an open-source machine learning JavaScript library by Google, which can be used for different purposes such as training neural networks in the browser, understanding ML models, for education purposes, etc. You can run pre-trained models in inference mode. “ –

[Source : <https://ai.google › tools>]

Simple Review of Some Published Information on Designing Algorithm/s –

“ Ruby on WebAssembly for readers to try in the context of Ruby/LLVM/Emscripten/Javascript – by April 28, 2018 – Tom Black.

So here’s my advice for anyone who wants to make a dent in the future of web development: time to learn how compilers work.” – Tom Dale.

“The hope is that LLVM will usher in a new era of software development where applications can freely move from machine to machine and even from processor to processor”.

[1]. C/C++ → LLVM → Emscripten → JavaScript(asm.js)

[2]. Ruby Script → Mruby Bytecode → C → Clang → LLVM → native executable

[3]. Ruby script → Mruby bytecode → C → emcc(Emscripten Compiler Frontend)→ LLVM → Binaryen→ WebAssembly

[Source : Tom Black — Ruby on WebAssembly<http://www.blacktm.com/blog/ruby-on-webassembly>]

Please Make a Note : [“I am not focusing on these issue/s in this Short Technical Note involving Image Processing –Just mentioning them only for your information”– Nirmal Tej Kumar]

[III] Related [JS/AI/IoT/HPC] based R&D Information on Mathematics & Software Used :

<https://llvm.org> > [devmtg](#) > [talks](#)

<ftp.math.utah.edu> > [pub](#) > [llvm](#)

<https://hacks.mozilla.org/2017/03/why-webassembly-is-faster-than-asm-js/>

[Turbocharging Client-Side Processing: Leveraging asm.js – YouTube/](#)

<https://wasmweekly.news> > [issue-84](#)

<https://porter.io> > [github.com](#) > [njoy](#) > [opencvjs](#)

<https://tech.ebayinc.com> > [engineering](#) > [webassembly-at-ebay-a-real-worl...](#)

<https://hoverbear.org> > [2017/04/06](#) > [the-path-to-rust-on-the-web](#)

<https://www.swi-prolog.org> > [build](#) > [WebAssembly](#)

The Design, Implementation, and Deployment of a System to ...<https://arxiv.org> > [pdf](#)/by D R Horn - 2017.

<https://webassembly.org> > [getting-started](#) > [developers-guide](#)

www.davevoyles.com > [2015/10/06](#) > [getting-started-with-emscripten](#)

<https://emscripten.org> > [docs](#) > [getting_started](#) > [Tutorial](#)

<https://llvm.org> > [devmtg](#) > [talks](#)

<https://clang.llvm.org> > [docs](#) > [CommandGuide](#) > [clang](#)

<https://github.com> > [koka-lang](#) > [libhandler](#)

<https://github.com> > [symengine](#) > [symengine](#)

*** <https://www.marvinj.org/en/index.html> – MarvinJ is a pure javascript image processing framework derived from Marvin Framework. This front page gives you a glimpse of how easy and powerful is MarvinJ for many different image processing applications. Check the page source [here](#) .

eigen.tuxfamily.org >

www.blacktm.com > [blog](#) > [ruby-on-webassembly](#) – Very Important Note.

<https://github.com> > [wasmerio](#) > [ruby-ext-wasm](#)

<https://github.com> > [blacktm](#) > [ruby-wasm](#)

[Ruby on WebAssembly | Hacker News](#) – <https://news.ycombinator.com> > [item](#)

*** [Marvin Image Processing Framework](#) – marvinproject.sourceforge.net

*** <https://java-source.net> > [open-source](#) > [general-purpose](#) > [marvin](#)

*** <https://www.nobleprog.in> > [marvin](#)

*** <https://github.com> > [gabrielarchanjo](#) > [marvinproject](#)

*** Java based Natural Language Processing(NLP)-JProlog-Marvin-JikesRVM as Informatics & Image Processing Platform to Probe & Process Cryo-EM Images – A Simple & Useful Suggestion in the Context of Electron Microscopy(EM) Domains. – [<http://vixra.org/pdf/1804.0028v1.pdf>] – by Nirmal Tej Kumar.

*** aijs.rocks – <https://aijs.rocks> – A curated collection of inspirational AI-powered *JavaScript* apps.

Find examples of artificial intelligence and machine learning with *JavaScript*. ... content checking for the soul. *TensorFlow.js*; *Image* Recognition ... A Chest X-ray *Diagnostic* Tool. *TensorFlow.js* ... RNN-based Rhythm Generation and Audio Classification.

*** <https://bioimagesuiteweb.github.io> > *images* > *IntroToBioImageSuiteWeb*

*** [MIRMAID: A Content Management System for Medical Image Analysis ...](https://pubs.rsna.org) - <https://pubs.rsna.org> > *doi* > *full* - by PD Korfiatis - 2015.

*** [AI JavaScript London \(London, United Kingdom\) | Meetup](https://www.meetup.com) - <https://www.meetup.com> > *AI-JavaScript-London* - This group is for *JavaScript* developers with an interest in *AI* and Machine Learning. Machine learning has predominantly been a field reserved for Python and R...

[IV] Acknowledgment/s :

Special Thanks to all WHO made this happen in my LIFE. Non-Profit R&D Only.

[THE END]