

SOFTWARE ENGINEERING

IN THE MARIOKART SYSTEM

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- 1 BUILD TOOLCHAIN
 - GNU, GNU, GNU
- 2 SOURCE CONTROL
 - Git
 - Github
- 3 CONTINUOUS INTEGRATION
 - What is it?
 - Why would you use it?
 - CI Joe
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- 4 QUESTIONS

- `arm-eabi-gcc` – The GNU Compiler Collection

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- `openocd` – Open On-Chip Debugger

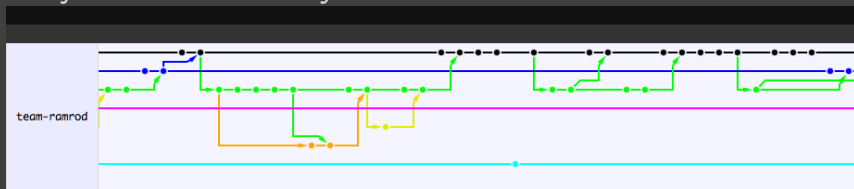
- `arm-eabi-gcc` – The GNU Compiler Collection
- `arm-eabi-gdb` – The GNU Project Debugger
- `openocd` – Open On-Chip Debugger
- `GNU make`
 - Lots of targets to enable easy programming, debugging and testing.

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- Very *“branch-friendly.”*



ABOUT


“Originally founded by Chris Wanstrath, PJ Hyett and Tom Preston-Werner as a project to simplify sharing code, GitHub has grown into an application used by nearly a million people to store over two million code repositories, making GitHub the largest code host in the world.” – <https://github.com/about>







WEB INTERFACE[†]

name	age	message	history
 Altium/	September 03, 2011	Updated the pdf [steakunderscore]	
 CAD/	September 08, 2011	Stress calculations and visual output [SimonRichards]	
 Documentation/	12 minutes ago	Merge branch 'master' of github.com:team-ramrod/ma... [steakunderscore]	
 Modeling/	September 09, 2011	completed models [Simon Richards]	
 Simon/	about 6 hours ago	more text [SimonRichards]	
 Software/	3 days ago	Merge branch 'master' of github.com:team-ramrod/ma... [Nemo157]	
 .gitattributes	April 25, 2011	Spelling mistake in gitignore and gitattributes. A... [Nemo157]	
 .gitignore	3 days ago	Added my presentation [Nemo157]	
 README.md	August 24, 2011	an attempt to annoy wim [SimonRichards]	

[†]<https://github.com/team-ramrod/mariokart>

WIKI[†]

 team-ramrod / mariokart

 Admin  Unwatch  Fork  Pull Request  3  2

Source Commits Network Pull Requests (0) Fork Queue Issues (0) **Wiki (34)** Graphs Branch: master

Home Pages Wiki History Git Access

Home

New Page Edit Page Page History

Welcome to the mariokart wiki!

Project Goal

This was taken from the initial project list:

The aim of this project is to take the departments go-karts and build in a system to replace the human driver. This will entail (at least), selection of appropriate actuators, motion and distance sensors, development of a navigation system, an interface to the existing control system, and a central computing platform. A suitable navigational goal would include a circumnavigation of S block.

[†]<https://github.com/team-ramrod/mariokart/wiki>

WHAT IS CONTINUOUS INTEGRATION?

DEFINITION[†]

“Continuous Integration is a software development practice . . . leading to multiple integrations per day . . . verified by an automated build . . . to detect integration errors as quickly as possible.” — Martin Fowler

[†]<http://martinfowler.com/articles/continuousIntegration.html>

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- Detect errors early.
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 - Very useful for branch-happy development in git.
- Peer pressure 🤖.

REPOSITORY DESCRIPTION

"CI Joe is a fun Continuous Integration server."

[†]<https://github.com/defunkt/cijoe>

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- Simple setup.
- Designed to work with git.
- Can trigger a build via a post-hook on github.
- Reports status via build-hook (used to send email).

[†]<https://github.com/defunkt/cijoe>

EXAMPLE 1

CI Joe because knowing is half the battle

mariokart

Build

2011-09-18 01:28 » Built master at [b464a16](#) (worked) in 135.826144 seconds.

EXAMPLE 1

CI Joe because knowing is half the battle

mariokart

2011-09-18 03:20 » Build starting...

2011-09-18 01:28 » Built master at [b464a16](#) (worked) in 135.826144 seconds.

EXAMPLE 1

CI Joe because knowing is half the battle

mariokart

Build

2011-09-18 03:20 » Built master at [fc2a97c](#) (failed) in 4.422625 seconds.

```
make: Entering directory `/var/www/cijoe-repos/mariokart/app/Software'
make[1]: Entering directory `/var/www/cijoe-repos/mariokart/app/Software'
src/brake/main.c: In function 'main':
src/brake/main.c:102:27: error: expected expression before ';' token
src/brake/main.c:135:5: error: expected ';' before '}' token
src/brake/main.c:97:15: error: unused variable 'msg' [-Werror=unused-variable]
cc1: all warnings being treated as errors

make[1]: *** [build/objs/src/brake/main.o] Error 1
make[1]: Target `rebuild' not remade because of errors.
make[1]: Leaving directory `/var/www/cijoe-repos/mariokart/app/Software'
make: *** [test] Error 2
make: Leaving directory `/var/www/cijoe-repos/mariokart/app/Software'
```

From: CI Joe <cijoe@nemo157.com>
Subject: Building mariokart Failed
Date: 18 September 2011 3:21:23 PM NZST
To: ag@henryjenkins.name

[Hide](#)

[1 Duplicate](#) **2**

Building **mariokart** failed

Latest commit info:

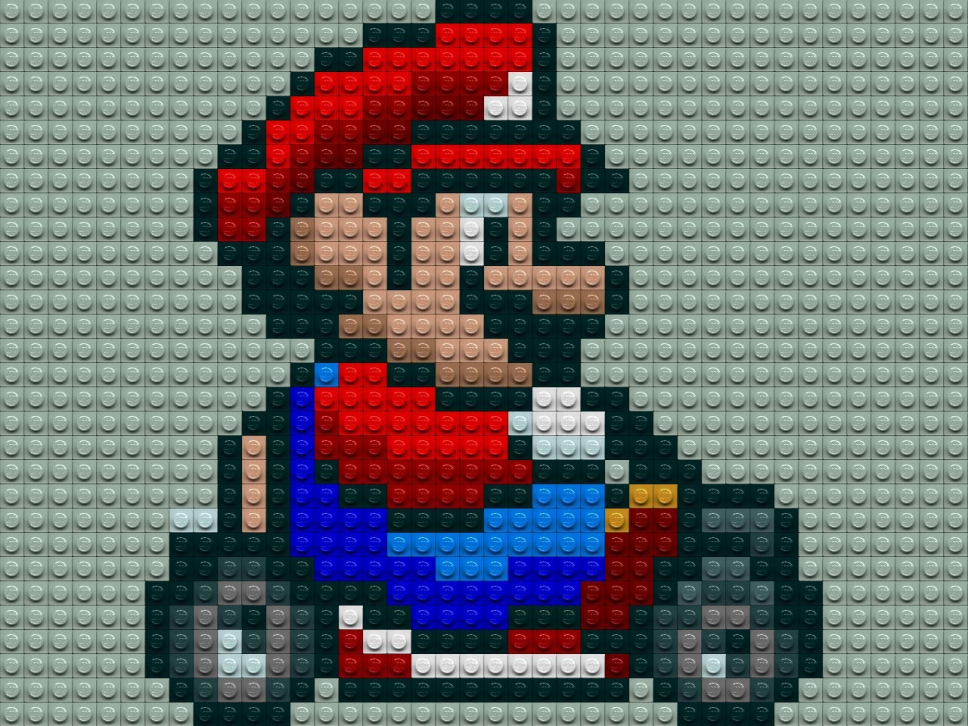
- fc2a97c: Breaking the build for my presentation - Wim Looman <ghostunderscore@gmail.com>

Build Output

```
make: Entering directory `/var/www/cijoe-repos/mariokart/app/Software'
make[1]: Entering directory `/var/www/cijoe-repos/mariokart/app/Software'
src/brake/main.c: In function 'main':
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--
CI Joe
Because knowing is half the battle.



GIT

- Distributed (Generally used with a centralised repository).
- Every clone is a full repository.
- High continual branching and merging is expected behaviour.

SVN

- Needs a single central repository.
- Can't commit without access to central repository.
- Branching and merging is painful.

GIT OVERVIEW

GITHUB OVERVIEW

- Initially was planned.
- Would require mocking and simulating the entire SAM7XC architecture.
 - Hundreds to thousands of registers.
 - Need constraints on which registers get written in which orders.
- Would be awesome, but probably too large for even its own final year project.