Day 2

Workshop: Git and GitHub

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Overview

1. GitHub Pages and Jekyll
2. GitHub Mobile App
3. GitHub Student Developer Pack (GitHub Education)
4. GitHub Open Source Projects
5. GitHub Community
6. Programming Example
7. Programming Challenges

Disclaimer

Pages

1. GitHub allow users to have one personal (static) site.
2. Allows a site per project.
3. Jekyll is the site-generator behind GitHub Pages. There are plenty of templates written in Liquid. [1]

[1] See here http://jekyllrb.com/docs/templates/. If you are one of those geeks... you can also use CSS templates.

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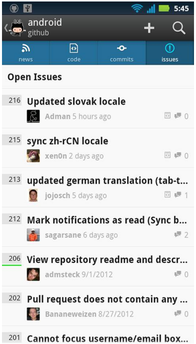
Mobile App



GitHub for Android[a]

1. Issue Dashboard.
2. Gist Support.
3. News Feed.

[a] https://mobile.github.com/

Off course, it is not a replacement for a Desktop client. But it is good enough to keep track of some changes on the go.

GitHub Student Developer Pack

A couple of months ago GitHub (with some companies) released a pack of free tools for students[2]. Here we present some of them that were arbitrarily chosen.

1. Atom: a text editor developed by GitHub.
2. CrowdFlower: data enrichment, data mining and crowdsourcing services.
3. GitHub: 5 Private GitHub Repos.
4. SendGrid: Email services.
5. Unreal Engine: A suite of game development tools for PC, console, mobile and web.

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GitHub Open Source Projects

GitHub Community

Verlet Integration I

Verlet integration is a numerical method used to integrate Newton's equations of motion. It is frequently used to calculate trajectories of particles in molecular dynamics simulations and computer graphics.
If we do a Taylor expansion of the position vector $\vec{x}(t \pm \Delta t)$ forwards and backward we get

$$\vec{x}(t+\Delta t) = \vec{x}(t) + \vec{v}(t)\Delta t + \frac{\vec{a}(t)\Delta t^2}{2} + \frac{\vec{b}(t)\Delta t^3}{6} + \mathcal{O}(\Delta t^4)$$
$$\vec{x}(t-\Delta t) = \vec{x}(t) - \vec{v}(t)\Delta t + \frac{\vec{a}(t)\Delta t^2}{2} - \frac{\vec{b}(t)\Delta t^3}{6} + \mathcal{O}(\Delta t^4),$$

Verlet Integration II

Adding these two expansions gives

$$\vec{x}(t + \Delta t) = 2\vec{x}(t) - \vec{x}(t - \Delta t) + \vec{a}(t)\Delta t^2 + \mathcal{O}(\Delta t^4).$$

We can see that the first and third-order terms from the Taylor expansion cancel out, thus making the Verlet integrator an order more accurate than integration by simple Taylor expansion alone.

Small programming

Thank you for your attention.