Perspectives on Computational Analysis: Git and GitHub

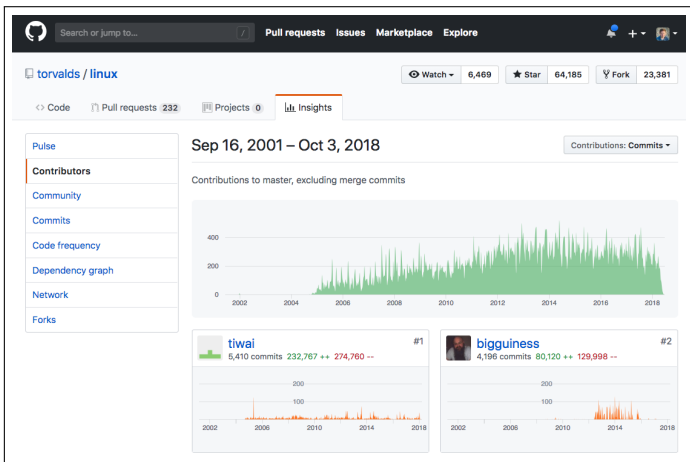**Dr. Richard W. Evans**

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Git and GitHub background

- Git is version control software primarily for your local machine
  - Git has some capability to perform version control operations on remote machines through the internet
- GitHub is a cloud-based service that coordinates online collaboration through Git software
  - Great combination of decentralization, hierachical permissions, open democracy, remote file storage, local functionality, attribution, and collaboration
- GitHub was recently bought (June 2018) by Microsoft for $7.5 billion
  - Microsoft CEO has been big on open source
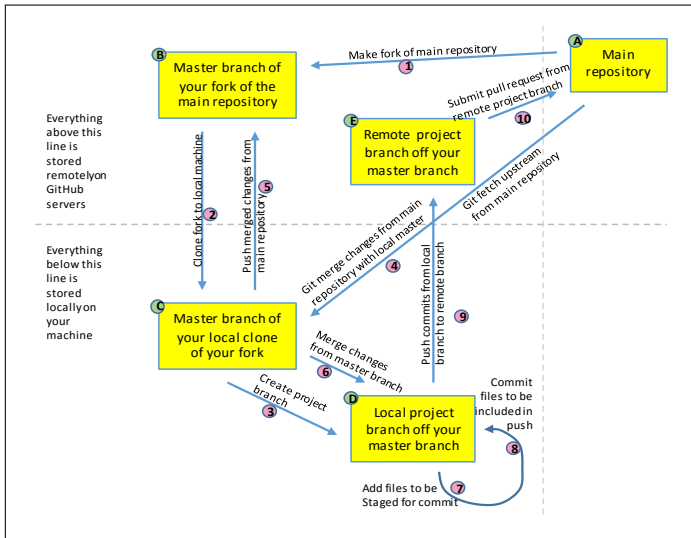- Alternatives to GitHub are: Bitbucket, GitLab, Assembla, Helix Core

Workflow and Structure

Git, GitHub, and Linux

Git was developed and is still used to create and develop the Linux kernel

Git workflow

Fork, clone, remotes, fetch, merge

Go through fork, clone, remotes

- `fork` **main repository**
- `git clone` **remote fork**
- `git remote add upstream [main repo URL]`

Go through fetch, merge, push

- `git fetch upstream`
- `git merge upstream/master`
- `git push origin master`

Branch, add, commit, push, pull request

Go through branch, add, commit, push

- `git checkout -b [BranchName]`
  - See Git Koan "One Thing Well"
- `git status`
- `git add [FileName]` **or** `git add -A`
- `git commit -m "[explanatory message]"`
- `git push origin [BranchName]`
- Branching helps avoid "complete burn down"

Go through pull request

- Go to remote repository web site
- Click "New pull request"
- Include description of what PR does

Peripheral Git operations

- Resolve merge conflicts with merge tool

- Use a Git and GitHub GUI

- Make a PR to someone else's PR

Collaboration examples: Issues

- OG-USA, tax functions discussion

- taxdata, machine learning vs. regression

- Version tags help to mark way points that worked (European Commission)

Git and GitHub are great marketing for you

- Contributing to open source repos is a way to get in with faculty/research group

- Posting tools brings researchers/collaborators to you

    - Dan Sullivan, econtools, regression tools for Python

    - Haylee Ham, module to get labor hours from CPS

- A number of economics groups are facilitating/encouraging

    - QuantEcon, Open Source Macroeconomics Laboratory, Econ-ARK, CBO, U.S. Census, India Ministry of Finance, State of Connecticut

- GitHub page better than resume for developers

Go through Assignment