AIMA-Javascript GSoC 2019 guide

Hey all! I'm Sam Goto (goto@google.com), and I'll be your mentor this year for the AIMA Javascript Project for the AIMA Code organization!

We're building visual interactive **explanations** for concepts from the AIMA textbook. We're looking for people who have design and explanatory skills, and can implement visualizations in Javascript. Take a look at the work from 2018 to get an idea of what you will be building in GSoC. We'd love to build explanations like these.

Read this guide first. If you have more questions, check the FAQ and ask on the gitter channel.

How to contribute?

Some students like to start early by contributing code to a GSoC project. AIMA-Javascript is different. We are looking for *sample work* on your own site, not contributions to the aima-javascript project. This will be two things:

1. **Project proposal** - a *design document* that describes your summer project
2. **Prototype** - an *implementation* of the beginning of your proposal

Email me to say "hello" :) and come to the Gitter chat to meet fellow students.

Project proposal

A proposal document describes the work you plan to do over the summer. The summer work will be an **interactive explanation of a topic from AIMA**. The proposal document will be the text and structure of the explanation without implementing the interactive parts. You will implement the interactive parts over the summer.

1. Read the proposals from 2018 to get an idea of what they should look like. Be sure to read the feedback from the mentor so that you know what could be improved.
2. Pick a topic from AIMA that you think would be better with a visual interactive explanation. Look at the existing pages and pick a topic that hasn't already been explained, or something that you think could be explained much better.
3. Create a Google Doc for your design doc.

4. Form a narrative, as explained here.
5. Look at the design patterns that have emerged in good work.
6. Create wireframes
    a. With a narrative formed and some basic ideas of which diagrams you want to build and which controls they'd have, create section in your design doc called "wireframes" to give you a clean canvas to put your thoughts in practice.
    b. Use text to connect the diagrams and form a flow.
    c. Use static diagrams (recommendation: google docs has some really good diagraming tools) or static images (e.g. photoshop or whatever) to turn some of your ideas more concrete (e.g. which controls would you expose? how much space would you need? does it connect well with the text? are some of the controls mixed with the text around it?).
7. Get feedback.
8. Add a comment on this page with a pointer to your design doc.

Prototype

After you have written your design document, make a prototype of one of the visualizations in your proposal.

1. We are less interested in seeing your ability to productionize code and more your ability to design good visualizations — quality, autonomy and expediency here is more important than technical/coding robustness, elegance or purity.
2. Use Github pages as the host.
3. Use whichever CSS/HTML/JS framework you are most familiar/productive with
4. Get more feedback. Add the link to your prototype here.

Advice from GSoC 2017

When you write your application, include links to the design doc, prototype, and feedback thread.

What is it like?

Your summer work will be about making a visual interactive explanation of topics from AIMA, with interactive diagrams implemented in Javascript. There is a lot of experimentation trying different types of explanations and visualizations to figure out which ones work best. Take a quick look at notes from previous years:

- 2017 scope
- 2017 strategy
- 2017 accomplishments
- 2018 notes

Most importantly, take a look at advice on future work and the lessons learned. The important dates from the GSoC timeline:

- February 26: Google will announce whether AIMA will be part of GSoC 2019
- March 25 – April 9: students apply to GSoC by writing a proposal
- May 6: Google announces which students will be part of GSoC
- May 27 – August 26: students work on their GSoC project
- June 26, July 28, September 2: AIMA evaluates your work

How to apply?

There are three main resources that you want to collect to apply:

1. About yourself
2. About your work
3. About your summer

Tell us about yourself:

1. resume, name, email, school, year
2. personal projects and
3. online footprint (e.g. blog, github, twitter, etc)

Tell us what you want your summer to be like:

1. Form a plan: what chapter, concepts, and algorithms would you like to explore?
2. Include a link to your project design doc (Google Docs) and prototype (Github Pages).
3. Tell us why you think that's a realistic plan: do you have other commitments?
4. Tell us how would you like to work together.

Bonus points: show us a sample of your best work

We are looking for a solid record of achievement in building high quality educational material.

If you already have sample work that shows your skills with interactive explanations of technical topics (whether related to AI or not), great! Point us to it. Examples: this explanation of the trie data structure or this explanation of the diff algorithm or this demonstration of reinforcement learning or this explanation of hyperloglog. You can see what it takes to make an interactive page like this by first reading this explanation of line drawing, then looking at how it was implemented.

What are we looking for?

First and foremost, we are looking for students that have the ability to create really good **explanations** of algorithms in the book serving readers. **Readers first, code elegance second**.

We'll be looking at students from this order:

1. teaching skills
2. autonomy and engagement
3. coding

evidence of teaching skills

Students will be compared first and foremost by the efficiency of their explanations: a solid record of achievement in building educational visualizations. As a general rule of thumb, we'll prefer students who have made a few high quality visualizations over students who have made lots of low quality visualizations.

Here are some of the criteria to judge quality:

- how well can you explain/present algorithms?
    - is it better than reading the book alone?
    - is it better than watching the class alone?
    - is it easy to comprehend for a large number of students with a varying degree of prior knowledge?
    - are the controls intuitive and powerful?
    - is it visually and aesthetically appealing?
    - is it correct?
    - if you sent this to an arbitrary CS/AI student who read the book, would they recommend others going through that visualization?

- can you execute well?
    - do you feel like you know in which order to do things?
        - are you able to design things prior to prototyping?
        - are you able to prototype things prior to productionizing?
        - are you able to write good production code?
    - do you have a good intuition on when to pivot and when to push further?

Here is some advice from a former GSoC student.

evidence of autonomy and engagement

- are you able to move independently?
- are you able to know when to ask questions / escalate?
- are you able to listen and act on feedback?
- are you able to follow guidelines (e.g. is your application inconsistent with this guideline)?
- are you able to look at prior art independently?
- are you able to look for answers in community forums (e.g. lists, chatrooms) before asking them?
- have you engaged early and often?
- how many rounds of reviews have we gone through?
- do you feel like we have made good progress during the interaction?
- how good do you think your design is turning out?
- what are your plans for the summer?
- do you think you have formed a solid plan of attack?
- how many visualizations do you think you can build?
- how often would you like to meet?
- tells us how you think your summer as a GSoC student will look like.

evidence of coding skills

- how is your CSS/HTML/JS kung-fu?
- do you know git?
- do you use TDD?
- links to existing projects?