COMMUNITY-DRIVEN PLATFORM FOR AIMA-EXERCISES

PROPOSAL: GOOGLE SUMMER OF CODE 2018

Nalin Chhibber, University of Waterloo 17/02/2018

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1 About me

1.1 Introduction

- **Name:** Nalin Chhibber
- **Github:** nalinc. 100+ repositories, 400+ commits in the last year(>1 commit everyday)
- **Stackoverflow:** nalinc. 6500+ reputation, 164 answers, 0 questions, reached 395k people.
- **Program/University:** MMath Computer Science, University Of Waterloo

I am a first year student of MMath Computer Science at University of Waterloo, Canada. Waterloo is known as the Silicon valley of Canada and is one of the best institutions for Computer Science. I am a part of Human Computer Interaction Lab where I work on conversational agents and the role of games in voice-only interactions. I am performing well in academics and plan to keep on improving.

1.2 Prior Experience

- Before joining Waterloo, I was a part of Stanford's crowdresearch collective by Michael Bernstein and published few papers on general crowdsourcing. [4, 5, 6, 7]
- During my undergrad, I interned at the Scientific-Information-Services group at CERN, Geneva(Switzerland) where I worked towards the upgradation of metadata on CERN Document Server from Elsevier and Forschungszentrum Jülich records. [1]
- I have also worked with Gopal Krishna Patra, a principal scientist at CSIR-Fouth Paradigm Institute, Bangalore(India) under SPARK (Student Program for Advancement in Research Knowledge). [3]
- My most relevant experience w.r.t current project is my prior involvement with Python Textbook Companion Project by FOSSEE at IIT-Bombay, where I single-handedly ported the examples of the book "Programming in C by Stephan G kochan" to multiple Jupyter Notebooks. [2]
- I have been involved in contributing towards various open-source projects(KDE Kstars, KDE KNavalBattle, hint.css, marked)
- I am active on stackoverflow.

1.3 What interests me about this project? Why is it worth doing?

I studied "CS #686: Introduction of Artificial Intelligence" last term and AIMA was one of the recommended books. However, there were limited hardcopies in the library. Although I managed the study from a digital verison, I genuinely felt the need to connect with fellow students on certain exercise questions and discuss possible approaches to popular problems. AIMA has become the de-factor standard to teach Artificial Intelligence in most of the Universities in the world and therefore it is important to bring the student community together on a common platform, so they can not only access the book online, but also discuss exercise questions and problems they face while solving them. I envision to create a stackoverflow-like community for AIMA-exercise.

1.4 Why should I be chosen

- I created # pull requests and got # commits merged into aima-exercises in past one month.
- I have read AIMA 3rd edition religiously and solved many of the exercises myself as a part of the course. The fact that I only had access to digital version of AIMA and not the hardcopy, means that all my notes and highlights are still preserved in Mendeley. This could help me during the project, everything will look like a revision.
- I already have solved exercise questions from most of the chapters. This will help in creating new exercises with solutions.
- I am proficient in Python and AngularJS. Apart from my projects for recent contributions towards aima-exercises here is a list of all my projects on Github:

2 Project Plan and Implementation Strategy

2.1 LaTeX to ipynb ~~markdown~~ conversion

Translate the current exercises from LaTeX into markdown (this may be done before GSoC starts). – Format to display exercises

2.2 System to rank/vote exercises

2.3 Authoring tool to add/omit exercises

2.4 Discussion Forum for community members

2.5 New high-quality exercises with solutions

Design a good format to display the exercises as pretty GitHub pages. Create some new, high-quality exercises, with solutions. Concentrate on exercises that require programming solutions. Your sample solutions have to not only solve the problem but also clearly demonstrate the concepts to the students. Create an encouraging community for volunteers to write new exercises and solutions and correct/augment old ones. Design a system where students can vote/rank exercises. Figure out a way to have the answers for some exercises hidden (so that professors can assign them as homework) and have the answers for others (and discussion forums) available for the community.

3 Tentative Timeline

Upto May 14 — LaTeX to ipynb conversion

- Convert as many exercises of AIMA 3rd edition to Jupyter Notebook format (and later to markdown)

May 14 — **Coding officially begins**

May 14-June 12 — Coding

- Implement a website to allow students to rank/vote exercises based on their popularity/difficulty.
- Implement an authoring tool to let community members add new exercises.

June 12 — Submit phase 1 evaluation

- Submit the complete code for website as well as authoring tool and update progress on the blog.

June 15 — **Phase 1 evaluation deadline**

June 15-July 10 — Coding

- Discussion forum for community members to discuss aima-exercises.

July 10 — Submit phase 2 evaluation

- Submit the complete code along with documentation for the forum and update progress on the blog.

July 13 — **Phase 2 evaluation deadline**

July 13-August 10 — Coding

- Create new exercises using the authoring tool

August 10 — Final work submission

- Submit everything and update the blog.

August 14 — **Final project submission deadline**

4 Communication

- **Timezone:** I will be working from Canada (EST / GMT -5:00)
- **Working Hours:**

  Weekdays(Mon-Fri): 4-5 hours daily (20-25 hours in 5 days)

  Weekends(Sat-Sun): 6-7 hours daily (12-14 hours in 2 days)

  Total: 32-39 hours per week
- **Classes:** I will have only one class a week for 2 - 3 hours. Not sure about the day.
- **Status meetings:** Once a week meeting with mentor (flexible)
- **Reachibility:**

  Hangouts: nalin.chhibber@gmail.com

  Skype: nalin.chhibber

  Email: nalin.chhibber@uwaterloo.ca, nalin.chhibber@gmail.com

  Phone: +1 4377799277

  Gitter, Slack?

5 Future directions for this project

References

[1] Chhibber, N. Enriching The Metadata On CDS. CERN Document Server.

[2] Chhibber, N. Programming in C, Python Textbook Companion Project.

[3] Chhibber, N., and Patra, G. Synchronization of chaos in multiple three-dimensional chaotic maps and its application in cryptography. In *2015 International Symposium on Technology Management and Emerging Technologies (ISTMET)* (Aug 2015), pp. 355–359.

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[5] Gaikwad, S. N. S., Whiting, M. E., Gamage, D., Mullings, C. A., Majeti, D., Goyal, S., Gilbee, A., Chhibber, N., Ginzberg, A., Richmond-Fuller, A., et al. The daemo crowdsourcing marketplace. In *Companion of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (2017), ACM, pp. 1–4.

[6] Gaikwad Snehalkumar'Neil'S, Nalin Chhibber, V. S. A. B. C. M. A. N., et al. Prototype tasks: Improving crowdsourcing results through rapid, iterative task design. In *HCOMP 2017, Association for the Advancement of Artificial Intelligence (www.aaai.org)* (2017), AAAI, pp. 2–4.

[7] Whiting, M. E., Gamage, D., Gaikwad, S. S., Gilbee, A., Goyal, S., Ballav, A., Majeti, D., Chhibber, N., Richmond-Fuller, A., Vargus, F., et al. Crowd guilds: Worker-led reputation and feedback on crowdsourcing platforms. *arXiv preprint arXiv:1611.01572* (2016).