Hacktive Matter: data-driven discovery through hackathon-based cross-disciplinary coding

Megan T. Valentine[1] and Rae M. Robertson-Anderson[2]

[1]Department of Mechanical Engineering, University of California, Santa Barbara

[2]Department of Physics and Biophysics, University of San Diego

Correspondence

valentine@engineering.ucsb.edu

randerson@sandiego.edu

Supplementary Materials

Year 1 Post-survey questions

Year 2 Post-survey questions

Year 3 Post-survey questions

Year 1 Post-survey questions

1. What best describes you?
   Multiple choice: faculty, postdoc, postbac, graduate student, undergraduate, staff scientist, high school student

2. How comfortable were you with DDM before the hackathon?
   Likert scale (1-5): 'not at all' to 'very'

3. My understanding of the physical principles used in DDM analysis has increased.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

4. My understanding of modeling approaches used to analyze the data collected in this project has increased.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

5. My understanding of the relationships between material dynamics and rheology has increased.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

6. I have gained new skills in using various software platforms to analyze data.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

7. I have a better understanding what my collaborators are working on and how they are approaching this project.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

8. After this workshop, my interest in working on active materials has:
   Likert scale (1-5): 'strongly decreased' to 'strongly increased'

9. After this workshop, my confidence in discussing my results has:
   Likert scale: 'strongly decreased' to 'strongly increased'

10. I expect to use what I learned in the hackathon in my research:
    Multiple choice: right away, in the next 6-12 months, maybe later, likely never

11. The length of time of the hackathon was:
    Multiple choice: too short, too long, about right

12. In thinking about the lectures, there were:
    Multiple choice: too many, too few, about right

13. In thinking about the lectures, they were generally:
    Multiple choice: too technical, too simple, about right

14. In thinking about the group work, there were:
    Multiple choice: too many sessions, too few sessions, about right

15. In thinking about the group work:
    Multiple choice: I would have preferred more structure, I would have liked less structure, I liked the format we used

16. I would be interested in attending the next hackathon:
    Multiple choice: Yes, No, Maybe

17. Please share some of your favorite aspects of the workshop
    Short answer reply

18. Please tell us if there were things that could be improved
    Short answer reply

19. Any other feedback?
    Short answer reply

Year 2 Post-survey questions

1. What best describes you?
    Multiple choice: faculty, postdoc, postbac, graduate student, undergraduate, staff scientist, high school student

2. How long have you worked in the biomaterials field?
    Multiple choice: < 1 year; 1-3 years; 3-5 years; 5-10 years; >10 years

3. How comfortable were you with the concepts of data screening before the hackathon?
    Likert scale (1-5): 'not at all' to 'very'

4. How comfortable were you with the concepts of database creation and management before the hackathon?
    Likert scale (1-5): 'not at all' to 'very'

5. My understanding of screening tools has increased
    Likert scale (1-5): 'strongly disagree' to 'strongly agree'

6. I have gained new skills in using various software platforms to analyze data.
    Likert scale (1-5): 'strongly disagree' to 'strongly agree'

7. My understanding of database tools has increased
    Likert scale (1-5): 'strongly disagree' to 'strongly agree'

8. My understanding of the approaches and skills of other DMREF team members has increased
    Likert scale (1-5): 'strongly disagree' to 'strongly agree'

9. I expect to use what I learned in the hackathon in my research
    Multiple choice: right away, in the next 6-12 months, maybe later, likely never

10. I expect that what I developed at the hackathon will be useful to others in my group
    Multiple choice: right away, in the next 6-12 months, maybe later, likely never

11. I expect that what I developed at the hackathon will be useful to researchers in other groups
    Multiple choice: right away, in the next 6-12 months, maybe later, likely never

12. I expect to use code that others developed in the hackathon in my own research
    Multiple choice: right away, in the next 6-12 months, maybe later, likely never

13. The length of time of the hackathon as:
    Multiple choice: too short, too long, about right

14. The scope of work for the hackathon was:
    Multiple choice: too much, too little, just right

15. I would be interested in attending the next hackathon:
    Multiple choice: Yes, No, Maybe

16. Please share some of your favorite aspects of the workshop
    Short answer reply

17. Please tell us if there were things that could be improved
    Short answer reply

18. Any other feedback?
    Short answer reply

Year 3 Post-survey questions

1. What best describes you?
   Multiple choice: faculty, postdoc, postbac, graduate student, undergraduate, staff scientist, high school student

2. I have attended a DMREF Hackathon at UCSB before
   Multiple choice: Yes, No

3. How comfortable were you with using Python software before the hackathon?
   Likert scale (1-5): 'not at all' to 'very'

4. My understanding of how to DEVELOP software for data screening and analysis has increased.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

5. My understanding of how to USE software for data screening and analysis has increased.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

6. I have gained new skills in using Python for data analysis
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

7. My understanding of high-throughput data processing has increased.
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

8. I have a better understanding of what my collaborators are working on and how they are approaching this project
   Likert scale (1-5): 'strongly disagree' to 'strongly agree'

9. After this workshop, my interest in working on data-driven analysis and modeling has
   Likert scale (1-5): 'strongly decreased' to 'strongly increased'

10. After this workshop, my interest in working on active materials design has
    Likert scale (1-5): 'strongly decreased' to 'strongly increased'

11. After this workshop, my interest in working more closely with my collaborators has
    Likert scale (1-5): 'strongly decreased' to 'strongly increased'

12. I expect to use what I learned in the hackathon in my research:
    Multiple choice: right away, in the next 6-12 months, maybe later, likely never

13. The length of time of the hackathon was:
    Multiple choice: too short, too long, about right

14. In thinking about the hackathon organization:
    Multiple choice: I would have preferred more structure, I would have liked less structure, I liked the format we used

15. I would be interested in attending the next hackathon:
    Multiple choice: Yes, No, Maybe

16. Please share some of your favorite aspects of the workshop
    Short answer reply

17. Please tell us if there were things that could be improved
    Short answer reply

18. Any other feedback?
    Short answer reply