Welcome, Clinic!

Take a clinic notebook and handouts

The 3 handouts are due Friday @ 4pm
        to CS Dept / Clinic (Olin 1260/1257)

Sit with your team:

Catch up / introductions
        summer overlaps?
        schedule overlaps?

Today: Clinic program overview and <u>first-week</u>

Introductions + roles…

George Montanez

Lucas Bang

Mark Kampe

Katherine Breeden

Zachary Dodds
Director, CS Clinic
2017, 2018, …

DruAnn Thomas
Coordinator, CS Clinic
… 2018 …

Advisors, CS Clinic
Welcome!

Ed VanderBilt
Liaison, Steelcase
x4

recruiter, worrier   *fixer!*   *faculty advisor*   *sponsor repr.*

Overview and first-week...

two topics today

Overview and first-week...

What is Clinic?

- Sponsored Student Capstone Project Course
- Starts in September, Ends in May
- Team of 4 to 5 Students & Faculty Advisor
- 10 hours/student/week, 1,200 -1,500 hours total
- Fee is $49,000
- Sponsor owns all IP

HARVEY MUDD COLLEGE

3

(recruiting slide)

Recruiting... *the adventure*

Sponsors

2018-2019 Project Descriptions

Sponsor	Title and link to description
A Capella	Telemetry and modeling for automatic tuning in Apache Cassandra
Accenture Labs	Representing and Communicating Intent in Human-Robot Teams
Biovia – Dassault Systemes	Augmented Reality for Improved Laboratory Outcomes
Booz Allen Hamilton	An All-Audie... Analysis and ...
Fluxergy	Developing R...
Google	Reviewing Co... reviews more ...
HP Inc.	Modeling, De... Anomalies in ...
HRL Laboratories (teaming with Physics)	Using Machin... Electrostatica...
Intuit	Journaled Ob... Source of Tru...
Jones Parking	ScreenPortal:... Single-User S...
Lawrence Livermore National Laboratory (teaming with Physics)	Finding the "... bilayers

MentorGraphics	Spatially-aware analysis of silicon wafermaps
Microsoft	Improving the reading experience through always-on eye tracking
MIT Lincoln Labs	Machine Learning for Autonomous Navigation and Robotics
MIT Lincoln Labs (Racecar for Education)	A High-performance Racecar Robot for Educational Outreach
New Relic	Modeling, Predicting, and Visualizing System-performance Time Series
OpenX	Applications of deep learning to advertisement quality
Proofpoint	Associating Attacks with Actors
Pure Storage	Implementing a Clustered NFS Server on a Pure Storage FlashArray
ServiceNow	Long-term Time Series Data: Optimizing Storage and Use
Steelcase	Wood Veneer Classification and Cataloguing For Finished Product
Verkada	Interpreting Image Streams in Multi-Camera Systems
Webroot	Analyzing The Web for HTTPS Certificate Reputation

Interesting projects!
Nonuniform interest…

Sponsor *benefits*

deliverables

- Results, prototype, pilot, study, …
- Insights, ideas, directions, …
- *Apprenticeship*: sponsors own the IP

(one of your forms)

- and -

connections

- Investigation
- Recruiting
- Collaboration

- and –

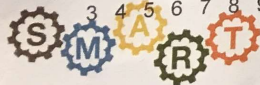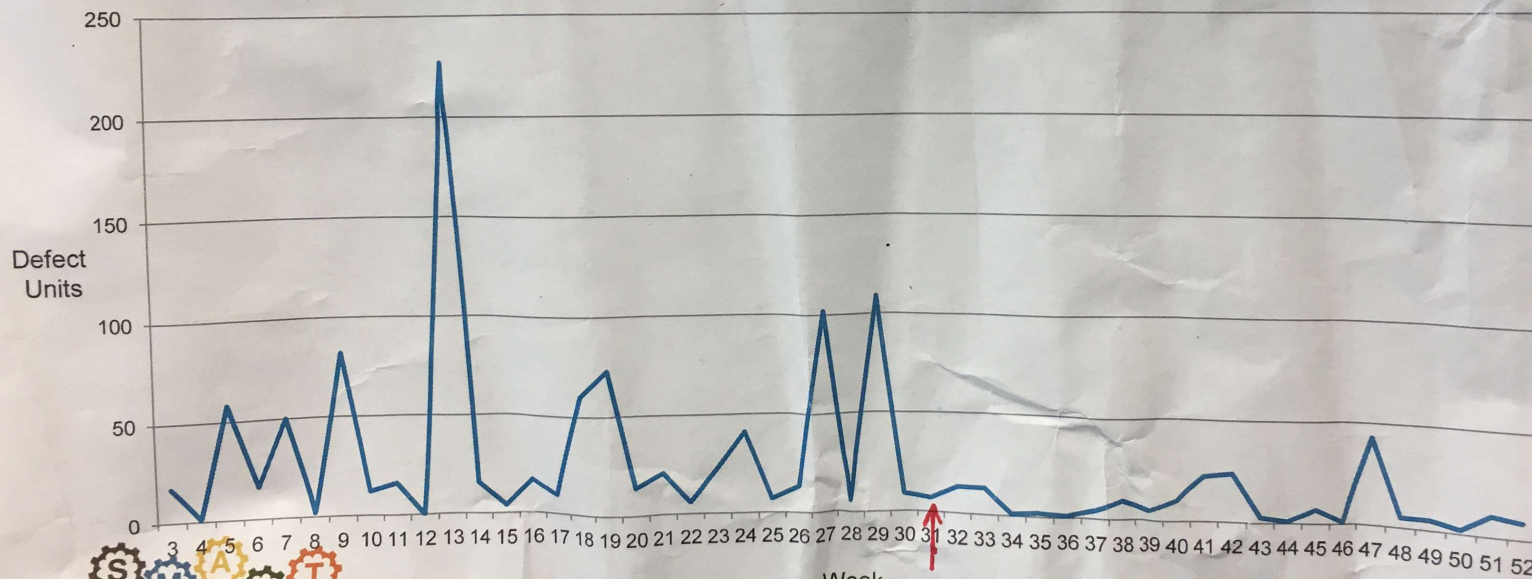**energy**

- Enjoyment!

Fees' purpose + use ?

Defining Success

- ▶ Sponsors are (usually) looking for insight and ideas
- ▶ "Failure" doesn't mean negative results, it means <u>lack of results</u>
- ▶ True failure usually comes from lack of team commitment & effort
  - ▶ Shows up in weekly meetings where nothing has happened and no ideas are forthcoming

The team is <u>central</u> in defining success.
This can feel quite different

Clinic is a Course

- Clinic expects 10 hours per week per student (more is ok, but be careful!)

- This includes teleconferences and Tuesday meetings

- About 1200-1500 person-hours per project

Key goal: optimize ***output value*** for your invested ***input time***

experiential...

Clinic is a Course

Manage Your Workload

- ▶ These are team projects; you can't do it all alone
- ▶ Distribute work to make best use of each person's skills
  - ▶ All team members, not just PM, responsible for load balancing
- ▶ If somebody slacks off for even one week, that's a permanently lost resource
  - ▶ You can't make up the time later!
- ▶ Your advisor is watching but it's your responsibility

Clinic is fundamentally a team experience

Clinic's Course Goals

Sponsors' Goals?   Alignment!

Clinic's Course Goals

- <u>Optimize output</u> for each week's 10+ hours input

- <u>Sustained professionalism</u> on an authentic, externally-motivated project

  REPLY!

- <u>Effective teaming</u>: collaboration and organization

Sponsors' Goals?   **Alignment!**

Roles

How the Liaisons Fit In

Liaisons:

- ► Usually came up with project, or at least were deeply involved
- ► Know the problem well
- ► Have unique knowledge that will help you
- ► *Care* about your progress and results

Keep liaisons informed (e-mail, teleconference, etc.)

But use their time efficiently; they are very busy people

busyness > business

key constraint: 1-2 hrs.

Roles

The Faculty Advisor

Advisor does *not* do the work of the project

Advisor *does*

- Keep you and your team on track
- Suggest how to solve problems and do research
- Offer ideas and suggestions
- Review all documents
- Assign your grade in consultation with me

Since 2015, all of the CS dept

Roles

How *You* Fit In

Useful to think of relationship as consultant (you) and client (sponsor)

 ▶ **NOT** employer/employee   *<u>can</u> be quite different from internships*
 ▶ You are helping them solve a tough problem
 ▶ May need to balance their needs against other demands

You *should* push back and/or change direction, as needed:
... the key is doing so <u>professionally</u>

A previous project example…

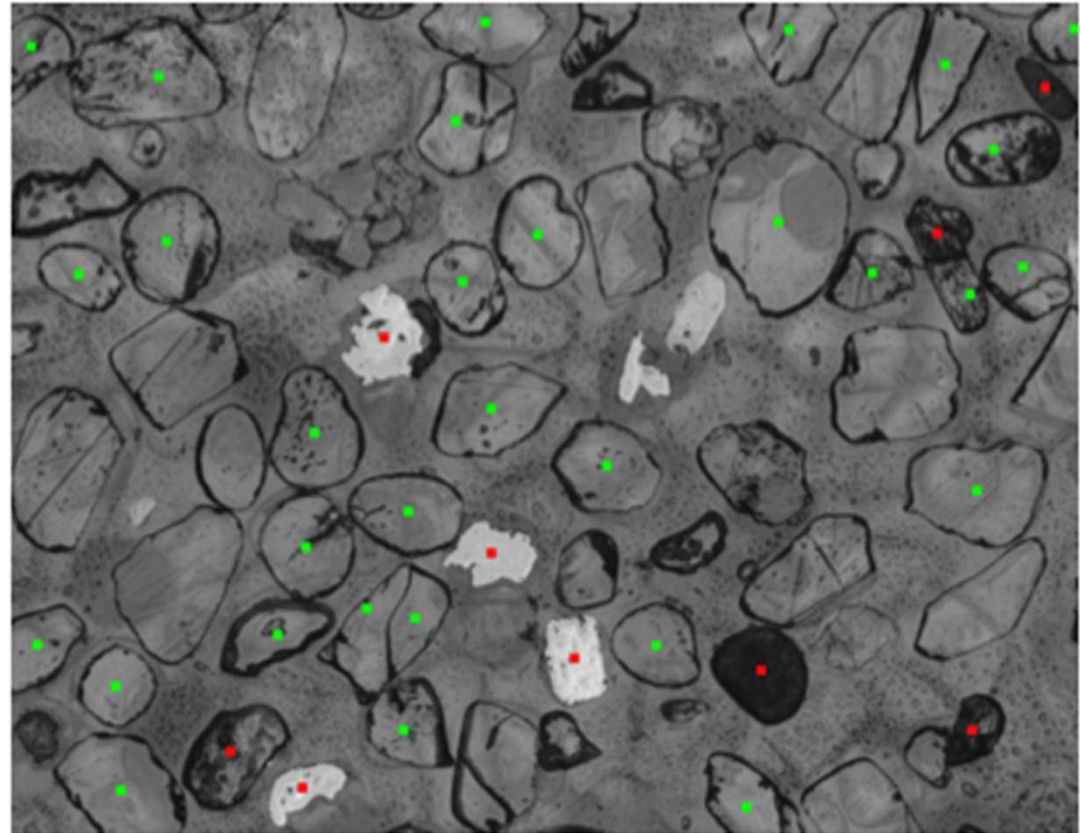Figure 1.4 Our provided microscope station.

Figure 6.2 Results of classification algorithm: green points are identified as apatite crystals and red points are non-apatite crystals.

Apatite to Zircon (4 clinic projects)

Resources

Where all of this information is located…

The Clinic Handbook details ALL of the clinic program.

Read this!

Overview and first-week...

and other details – some small, all important!

Overview and first-week...

and other details – some small, all important!

[Tuesday, September 4]
+ All clinic _students_ meet at our usual weekly timeslot (usually T 11am-12:15pm).
  + This one week, it will be 11-noon, because it is during HMC's convocation.
  + This one week, it will be in _Shanahan B480_, HMC's recital hall, because convocation is in McAlister
  + I'll overview the Clinic program; most faculty advisors will be at convocation

[Tuesday, September 4]
+ Your team should schedule a meeting with your fac. advisor
  + For Tuesday, ideally: many CSers are free T 4:15pm and/or T 5:15pm
  + If a team advisor does not have first-year advisees, Tuesday lunch/noon might work

[Wednesday, September 5]
+ Your team should meet to prepare for the liaison meeting Thursday
  + research and create an agenda (with questions/thoughts/plans/ideas)
  + send that agenda to liaison(s) no later than Wed. evening (advisors will help set details)

[Thursday, September 6]
+ This is Clinic Launch Day and the kickoff meeting with liaisons
  + the meeting with liaisons is 11am-1pm (it includes lunch)
  + the Project Manager (PM) _and_ another team member should come to the Aviation Room, by _10:50am_
  + to pick up your liaison(s) and your lunches & bring to your team's meeting room (TBA: Wed. morning)
  + The liaison(s) will present/lead. The team also presents/leads with questions/ideas.

Overview and first-week...

and other details – some small, all important!

First Meeting With Liaison(s)

- First meeting with sponsor will be this Thursday, 11:00 AM to 1:00 PM
  - Bag lunch will be provided
  - If you have class conflicts, let your advisor know *now*
- Two team members should come to the Aviation room to pick up lunches and escort liaison(s) to designated meeting area
- Liaison should give you crash introduction to project to help launch

2 team members, by 10:50am

Those 1-2 students bring the liaisons to a designated room: each team is assigned

For the liaison meeting

Dress Code

even if they're casual

Business casual on Thursday & for site visits

Think of every meeting with the liaison as a form of job interview

even if you're on another path

Preparation:

- Meet at least once *before* the liaison meeting

- Research the sponsor, the project, and context

  Be ready with questions
  Be ready with discussion directions
  Ask about preferred technologies/tools
    + ok to suggest your own
    + but be sure to get agreement!
  Be ready for administrative scheduling/organization
    + weekly calls   + fall site visit

- Create and print agendas

  Send with an introductory note the prior evening (Wed.)

Meeting expectations

Meeting Conduct

- Everyone should speak in every meeting—or imply:
  - Lack of interest
  - Lack of contributions
- Corollary: Project Manager shouldn't do all the talking
- **Take notes** throughout meeting
  - Needed for IP records
  - Helps focus your attention

nor should the advisor, ideally!

requires preparation and support

Meeting expectations

Meeting Minutes

Except for work sessions, every meeting (team, teleconference, etc.) should have minutes kept, and posted
- ▶ Rotate who takes them

Minutes must include:
- ▶ Attendance (who was present)
  - ▶ Note late arrivals **and arrival time** (including advisors and liaisons)
- ▶ What was discussed
- ▶ What was decided
- ▶ What was undecided or was planned for the future

can be notebook or laptop minutes (~advisor)

May come up:

NDAs

Many sponsors want non-disclosure agreements ("NDAs")

Most NDAs are fine **BUT** all must be approved by Clinic Director
- ► Goal is to protect you from unreasonable lawyers

If you have concerns about an NDA, talk to me right away

Definitely discuss:

Site Visit

Your team will make a site visit, usually soon, to:
- ► Tour sponsor's facility
- ► Meet key people
- ► Learn (lots) more about the project

Scheduling is between you, your advisor, and the liaison (but is often on a Friday)

Site visits are critical; don't miss them
- ► Your advisor or I will negotiate with other faculty if necessary

Site visits

Site visits

Definitely schedule:

Weekly Teleconference

but usually 15-30 minutes

▶ One call (up to 60 minutes) expected each week
▶ Always have written agenda, e-mailed by PM *at least* a day in advance
▶ Begin with each member's progress for previous week
▶ Then discuss issues, risks, plans
▶ Finish by having each member summarize next week's action items or tasks
   ▶ This is critical: people need to know what they should do

same level of professionalism (looser dress code? ~ maybe!)

reserve your conference room ASAP   (we have three)

backup option: faculty advisor's office

Inside a telecon...

```
4   /opt/mapr/spark/spark/bin/spark-shell --master yarn-client --queue dphgb --num-executors 100 --executor-memory 5
5
6
7   val recos = sc.textFile("/axp/pmpshared/dpdestiny/data/hgb/post_expedia_hive_db2/warehouse/
    train_expedia_5_25_capped").map(_.split("\u0001")).map(q => (q(1),q(2))).groupByKey().map{ t =>
8     val tmp =t._2.map(h => (h,1)).groupBy(_._1).toArray.map(hc => (hc._1,hc._2.size)).sortBy(-_._2).map(r => r._1)
9     t._1+","+tmp.mkString(",")
10  }
11  recos.saveAsTextFile("/axp/pmpshared/dpdestiny/working_dir/fp_thomas/tmp.StaticResults")
12
13
14
15  Lookalike based recommendations
16  ===============================
17
18  /opt/mapr/spark/spark/bin/spark-submit --class "SimpleApp" --master yarn-client \
19  --executor-memory 5g --num-executors 100 --queue dphgb \
20  /axp/pmpshared/dpdestiny/scripts/hotrec_v2.jar \
21  -t /axp/pmpshared/dpdestiny/data/hgb/post_expedia_hive_db2/warehouse/test_expedia_5_25_10p \
22  -i /axp/pmpshared/dpdestiny/data/hgb/post_expedia_hive_db2/warehouse/train_expedia_5_25_capped \
23  -o /axp/pmpshared/dpdestiny/working_dir/fp_thomas/testOut.5_25_10p.bf \
24  -d /axp/pmpshared/dpdestiny/data/hgb_v2/cust_level_hotel_smith_if_treated_14 \
25  -s /axp/pmpshared/dpdestiny/working_dir/fp_thomas/v1.schema.csv \
26  -k 100 -ct bruteforce -ot metrics
27
28
29  /opt/mapr/spark/spark/bin/spark-submit --class "SimpleApp" --master yarn-client \
30  --executor-memory 5g --num-executors 100 --queue dphgb \
31  /axp/pmpshared/dpdestiny/scripts/hotrec_v2.jar \
32  -t /axp/pmpshared/dpdestiny/data/hgb/post_expedia_hive_db2/warehouse/test_expedia_5_25_10p \
33  -i /axp/pmpshared/dpdestiny/data/hgb/post_expedia_hive_db2/warehouse/train_expedia_5_25_capped \
34  -o /axp/pmpshared/dpdestiny/working_dir/fp_thomas/testOut.5_25_10p.ct \
35  -d /axp/pmpshared/dpdestiny/data/hgb_v2/cust_level_hotel_smith_if_treated_14 \
36  -s /axp/pmpshared/dpdestiny/working_dir/fp_thomas/v1.schema.csv \
37  -k 100 -ct covertree -ot metrics
38
39
40
```

Line 26, Column 10

Clinic toolsets

Your Clinic Notebook

- ▶ You have an HMC notebook for Clinic
  - ▶ Number and date every page, new page per date
  - ▶ Cross out, don't erase or scribble out
- ▶ Patents can be decide (or lost) by what is recorded in notebooks
- ▶ *Everything* about Clinic should go into notebook
  - ▶ Chronological record of your thoughts
- ▶ Notebooks are collected at end of year
  - ▶ I.e., **NOTHING ELSE** goes in notebook!
- ▶ Electronic records should be on Trac,
  - ▶ I.e., **DON'T PUT CLINIC DATA ON YOUR LAPTOP!**

Trac ~ clinic-project specific wiki and management tool

Popular tools: github projects, Jira, Trello, google docs, many others…

key principles: secure + archivable

or other advisor + liaison-approved toolsets

Other Clinic Resources...

Email Aliases

- For sponsor "acme", standard aliases are (16 is for 2016–2017):
  - **acme16@cs.hmc.edu** reaches all team members and advisor
    - For "internal only" messages
  - **acme16l** ("ell", not 1) is acme16 plus liaison(s)
    - Use when liaisons need to be in discussion
  - **acme16liaison** will reach only the liaison(s)
  - **acme16pm** will reach only the project manager
  - **acme16advisor** will reach only the advisor
- Usually you will use **acme16** or **acme16l**
- All aliases are automatically archived in case we need records for patent purposes, etc.
  - I.e., use them even if you're just mailing one person (PM or advisor)

Warning: My email about this was incorrect! Note the "l" !

key principles: secure + archivable

Other Clinic Resources…

Equipment

- You have your own area and special computers on Sprague second floor.
  - Use Clinic computers for project, not your own!
- Your ID card opens SW corner stairway. Test it!

Non-HMCers, please go to F&M (in Platt) to gain access – soon!

- If you need other equipment or software, tell your advisor and me as soon as you know. Don't be shy!
- **DO NOT** appropriate equipment from other projects on the 2nd floor (or elsewhere) without asking!
  - This is an honor-code issue; people have a right to expect their equipment to be undisturbed—including apparently unused equipment and unopened boxes

some teams may need fifth machines – let me know what's needed!

Security

About Sprague

Second floor is a secure shared area—treat it as such. Non-Clinic people (friends, relatives) are not allowed.

We provide snacks
- Limited monthly budget
- Shopping trips are assigned to teams (we have CostCo card)
- This food is for SNACKS **while you're working**
  - Not for non-Clinic people
  - Not intended to substitute for meals (breakfast)

There is a vermin problem. Don't leave empties or dirty dishes lying around.
- Clean up IMMEDIATELY after finishing food
- Don't just put stuff in the sink

professionalism ~ with peers as much as liaisons

Security

More on Security

Crackers are attacking all machines on Internet, 24x7.

Your machine *will* be a target—and will be used for evil.

ALL accounts must have strong passwords—root, yours, git, etc.

"Strong": not in dictionary, not in frequent-passwords list. Special characters good. Four (truly) random English words good

If you're using Windows 10, be sure to turn off all monitoring, reporting, and "helpful" functions!

All Sprague machines have same initial password: change it **ASAP!**

key principles: secure + archivable

Back to the Bird's-eye View:

HMC CS Clinic Program: 2018–2019   current as of July 21, 2018

Sep. 3 Mon.	**7pm-7:30pm** Project managers' meeting (only PMs and Clinic Director need attend) (Fall semester begins the following morning.)
Sep. 4 Tue.	**11am-12:15pm** Full-clinic meeting in Galileo McAlister (students and clinic director)
Sep. 6 Thu.	**11am-1pm LAUNCH DAY** Team/Liaison/Advisor (face-to-face team meeting with liaisons)
Sep. 7 Fri.	**by 4pm** All Clinic forms are due to DruAnn Thomas in Olin 1257
Sep. 11 Tue.	**11am-12:15pm** Professional development in Galileo McAlister
Sep. 18 Tue.	**11am-12:15pm** Professional development in Galileo McAlister
Sep. 20 Thu.	Career Fair (Software engineering focus) in the LAC from 11am-2pm
Sep. 25 Tue.	**11am-12:15pm** Professional development in Galileo McAlister
Oct. 1 Mon.	**by 10am** **Draft statement of work due to advisor** (cc'ing Clinic Director and D. Thomas) ~ deadline extensions must be pre-approved by *both* clinic director and fac. advisor
Oct. 2 Tue.	**11am-12:15pm** Phase I Clinic presentations in McAlister and Beckman B126
Oct. 8 Mon.	**by 10am** **Fac.Adv.-approved, printed statement of work due to DruAnn Thomas** + email a copy to the Clinic Director and DruAnn Thomas ~ all extensions must be pre-approved by both clinic director and fac. advisor
Oct. 9 Tue.	**11am-12:15pm** Phase I Clinic presentations in McAlister and Beckman B126
Oct. 11 Thu.	Career Fair (Cross-STEM focus) in the LAC from 11am-2pm
Oct. 16 Tue.	**11am-12:15pm** Phase I Clinic presentations in McAlister and Beckman B126
Oct. 22-23	Fall break
Oct. 30 Tue.	**11am-12:15pm** Phase I Clinic presentations in McAlister and Beckman B126
Nov. 6 Tue.	**11am-12:15pm** Phase II Clinic design reviews (various rooms, TBD)
Nov. 13 Tue.	**11am-12:15pm** Phase II Clinic design reviews (various rooms, TBD)
Nov. 20 Tue.	**11am-12:15pm** Phase II Clinic design reviews (various rooms, TBD)
Nov. 27 Tue.	**11am-12:15pm** Phase II Clinic design reviews (various rooms, TBD)
Nov. 29-30	Thanksgiving break
Dec. 4 Tue.	**11am-12:15pm** Professional development in Galileo McAlister
Dec. 5 Wed.	**by 10am** Draft midyear update due to advisor (cc Clinic Director and D. Thomas) ~ deadline extensions must be pre-approved by both clinic director and fac. advisor

Dec. 11 Tue.	No clinic meeting: *work on Midyear Update*
Dec. 12 Wed.	**by 10am** **Fac.Adv.-approved, printed** *Midyear Update* **due to DruAnn Thomas** + email a copy to the Clinic Director and DruAnn Thomas ~ all extensions must be pre-approved by both clinic director and fac. advisor
Dec. 14 Fri.	Fall semester classes end and online-survey Clinic Feedback is due
Dec. 17-21	Final exam week
Jan. 21 Mon.	**7pm-7:30pm** Project managers' meeting (only PMs and Clinic Director need attend) (Spring semester begins the following morning.)
Jan. 22 et al.	**11am-12:15pm** Phase III Clinic presentations begin + Phase III presentations are held each Tuesday in one or more locations TBD + through the full spring semester: *these are mandatory to attend each week*
Feb. 7 Thu.	[[Date still to be finalized]] Career Fair (Cross-STEM focus) in the LAC from 11am-2pm
Mar. 18-22	Spring break
Apr. 1 Mon.	**by 10am** **Draft of poster design due to advisor** (cc Clinic Director and D. Thomas) ~ deadline extensions must be pre-approved by both clinic director and fac. advisor
Apr. 12 Fri.	Software <u>feature</u> freeze
Apr. 17 Wed.	**by 10am** **Draft of final report due to advisor** (cc Clinic Director and D. Thomas) ~ deadline extensions must be pre-approved by both clinic director and fac. advisor
Apr. 19 Fri.	Software <u>code</u> freeze
Apr. 22 Mon.	**by 4pm** **Final poster design emailed to Tim Buchheim** + cc both the Clinic Director and D. Thomas ~ all extensions must be pre-approved by both clinic director and fac. advisor
Apr. 22 Mon.	**by 4pm** **Draft of projects day presentation due to advisor** + cc Clinic Director and D. Thomas ~ deadline extensions must be pre-approved by both clinic director and fac. advisor
Apr. 30 Tue.	**11am-12noon** Final Phase III Clinic presentations (subject to change)
May 7 Tue.	**PROJECTS DAY** + posters up in Platt/Green Room by **9am** + two poster sessions, three final presentations (schedules TBA) + dinner with liaison(s), advisors, CAC, and all teams at 6:15pm in the LAC
May 10 Fri.	**by 4pm** **Printed, advisor-approved Final Report copies are due to D. Thomas** + printed on special paper D. Thomas will provide to teams + also emailed to both D. Thomas and Clinic Director
May 10 Fri.	**by 4pm** **Clinic work and workarea checklist due to Clinic Director or D. Thomas**
May 10 Fri.	Spring semester classes end and the online-survey Clinic Feedback is due
Late May	Spiralbound final report and other deliverables mailed to sponsor
Late August	Hardbound final report mailed to sponsor and students

If we have time…   Look over the plan for the year.

Back to the Bird's-eye View:

Manage Your Workload

- ► These are team projects; you can't do it all alone
- ► Distribute work to make best use of each person's skills
  - ► All team members, not just PM, responsible for load balancing
- ► If somebody slacks off for even one week, that's a permanently lost resource
  - ► You can't make up the time later!
- ► Your advisor is watching but it's your responsibility

Clinic is fundamentally a team experience

Back to the Bird's-eye View:

We Are All In a Time Box

Clinic is OVER on May 10, 2019

Don't waste precious time waiting for:
- ▶ Equipment to be purchased:
  - ▶ Ask for what you (think you) need NOW
    - ▶ Advisor can approve anything under $500.
  - ▶ Includes computers, storage, books, etc.
    - ▶ Books under $100: Don't even ask, just do it
- ▶ Information from liaison:
  - ▶ Time lost getting information is gone forever
  - ▶ If they're slow, you miss goals
  - ▶ Make sure they know that! (Remember they're busy)
- ▶ Work to be assigned to you:
  - ▶ Go out and get it! (But don't steal)

optimize the output of your 10+ hours

Bigger-picture

If You Have Issues

Address it right away:

- ▶ Discuss with your Project Manager, or
- ▶ Discuss with your Clinic Advisor, or
- ▶ Discuss with me (individually or in a group), or
- ▶ Talk to a professor you feel comfortable with (preferably CS)
- ▶ **Do not involve the liaison in internal politics**

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+ Your team should schedule a meeting with your fac. advisor
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  + If a team advisor does not have first-year advisees, Tuesday lunch/noon might work

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  + to pick up your liaison(s) and your lunches & bring to your team's meeting room (TBA: Wed. morning)
  + The liaison(s) will present/lead. The team also presents/leads with questions/ideas.

(*) Be sure to send a short email to your liaisons, introducing yourselves and looking forward to Thursday!

Topics where the team should take the lead

Be ready with questions
Be ready with discussion directions
Ask about preferred technologies/tools
    + ok to suggest your own
    + but be sure to get agreement!
Be ready for administrative scheduling/organization
    + weekly calls   + fall site visit

"Clinic finds a way"

- M. O'Neill

Thoughts?   *You're Clinic ~ Have fun!*