The Cornerstone

Point: Hey, could someone help me hang this whiteboard?

By Daniel Becker

So, my roommate has this awesome large whiteboard that we've been meaning to hang up in our apartment for a while. I don't know what we would do with it, probably write stuff on it. Maybe draw.

But that's not important. The problem is getting it up there.

You see, we have the perfect spot for it- it's right in the kitchen, so when we're eating breakfast or playing D&D or whatever goes on in there we can admire the whiteboardiness of the white board and revel in our own astounding glory. But there's a problem.

Our apartment contract doesn't want us to make any permanent marks. And before you say it, I know, I could probably get away with thumbtacks. But it's kind of a heavy whiteboard. So that's no good. But, there's a solution! Through a complex observational analysis that I call "looking," I found two attachment points: a vent on one corner and an exposed nail (in the closet of course) on the other. But with every solution comes a problem: the two hanging points aren't even, so if I just tied a rope straight from them to the whiteboard it wouldn't hang straight, and honestly, that would just be annoying.

But with every solution-problem comes another solution! On my own initiative, I went to the hardware store and picked up a couple of mountable hooks, with the plan of sticking them along the edge of the whiteboard (really the only viable attachment point). I figured if I attached them at the right points along the frame, I could set it up so that it would hang up straight.

Being a good engineer, once I got home I took a couple of quick measurements and set up some equations. Here's the derivation:
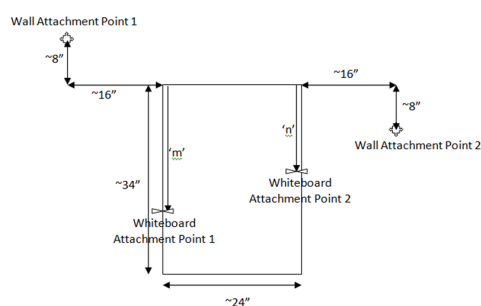
This illustration gives you all of the relevant dimensions. The math ends up being a little nicer if you define a couple angles θ_1 and θ_2
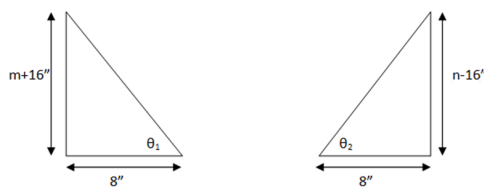
Upcoming Events:

- Wallyball Playoffs—2/9
- Friday Night Game Night—2/10
- Arb Work Day—2/11
- Broomball Playoffs—2/12
- Sequoia Place II—2/15
- UMEC Volunteering—2/17 & 2/18
- Ele's Place Grocery/Cooking—2/19
- Tutoring every Wednesday and Sunday

More information online at

http://tinyurl.com/7bjplpo

Please sign up online.

IM Roster sign up

umich.athleague.com/

Point: Hey, could someone help me hang this whiteboard? (cont'd)

Through simple trigonometry, we see that:

$$\theta_1 = \tan^{-1}\left(\frac{m+16}{8}\right) => m = \tan\theta_1 - 16$$

$$\theta_2 = \tan^{-1}\left(\frac{n-16}{8}\right) => n = \tan\theta_2 + 16$$

Now, temporarily resurfacing some of those trau-matic times that can only be called "Structures", I remembered that you can solve statics problems by setting up force and torque balances. The forces are pretty easy to set up, just sines and cosines. The torque is also pretty easy—I made an assumption that the attachment points will be on the bottom half of the whiteboard along the sides, which makes the torque simply the horizontal force multiplied by the dis-tance from the attachment point to the vertical center of the whiteboard (which is m-17 or n-17). Also, I introduce the variables "Fm" and "Fn" to track the magni-tude of the forces carried by the string. Here we go:

Dan with said whiteboard and cat.
(Pictured from left to right: Dan's Cat, Dan)

Horizontal: $F_m \cos\theta_1 = F_n \cos\theta_2$

Vertical: $F_m \sin\theta_1 = F_n \sin\theta_2$

Torque: $F_m \cos\theta_1 (8\tan\theta_1 - 33) = F_n \cos\theta_2 (8\tan\theta_2 - 1)$

Now, we have 4 variables (F_m, F_n, θ_1, θ_2) and only 3 equations. Our last equation is brought on by geomet-ric constraints (the hooks have to be attached on the whiteboard), and is actually an inequality:
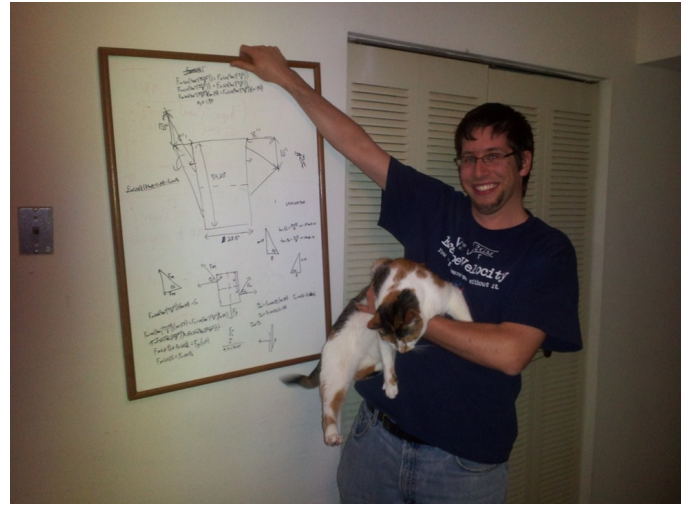
$$17 < m, n < 34$$

(The 17 is there because of our assumption about the hooks being attached on the bottom half). Even though we don't have 4 equations, it should be possible to just choose a value of m or n in that range and iterate through the other 3 equations a couple times until you find a solution, or find that there are no solu-tions to be had (hopefully not!).

There's just one last problem—these equations are nonlinear, and I cannot easily solve them either by hand or on a computer.

That's where you come in, TBP. Can you help me hang my whiteboard?

Incidentally, there are those who think I am "crazy" or "obsessed" or "taking hanging a whiteboard way too seriously" or perhaps even "not making the small angle assumption that would make all of your equations linear". To them, I say: "BAH!". And remember, if you use command strips or other such nonsense, the zombies win. And do you really want to support zombies?

…Seriously though, if anybody can help me solve these nonlinear equations I will be eternally grateful. ◊

Counter-Point: How to Hang a Whiteboard – A story about doubtful Dan

Submitted by Jon Gold

31 January 2012

BULLPEN—Recently, our diligent president ran into the bullpen, clearly stressed due to a dilemma of epic proportions- how to hang a large framed whiteboard in his apartment. Though Dan dreamt of expressing his brilliant ideas in a variety of designer colors, he could not seem to come up with any good ideas for mounting the board itself. The extent of Dan's progress to date was a series of three non-linear equations that he had yet to solve.

In a showing of pure compassion and care for a fellow man, residents of the bullpen offered plentiful suggestions. Some were straightforward - just nail it to the wall. Others were bolder – build a faux wall that contains the white board in front of the current wall. But the clear consensus opinion from engineering experts across many disciplines was to use Command Strips™. Dan, however, did not believe that these small sticky strips could possibly hold up his massive installation. Even after Elson Liu, our resident 3M encyclopedia, explained that the strips would certainly hold the whiteboard because "they aren't suggestion strips, they are Command Strips™", Dan remained doubtful. Well, here is an explanation of how to hang a whiteboard with Command Strips™, and a response to Dan's doubts (instructions taken from 3M product information).

> Step 1: Clean surface of board and wall.
>
> Step 2: Snap fasteners together to form a pair, with adhesive sides out.
>
> Step 3: Remove red liner and affix to the board. Remove remaining red liner.
>
> Step 4: Position board on wall and firmly press each set firmly for 30 seconds.
>
> Step 5: Remove board so that the strip pairs separate.
>
> Step 6: Firmly press on all strips for 30 seconds.
>
> Step 7: Wait 1 hour, then re-hang your board and enjoy!

Issues Dan Raised:

1) The board is too heavy to be held by adhesive strips

2) The frame is too skinny for the strips to stick

Solutions:

1) Command™ Large Picture Hanging Strips are rated to hold up to 5 lbs. each. Thus, even if you had a 6' x 10' framed whiteboard weighing approximately 96 pounds, you could still use 20 Command Strips™, or one every 19 inches around the perimeter. This would be possible for the low price of $20.05 plus tax. And, the board would be removable and re-mountable because the strips are 2-sided plastic super-velcro!

2) If the frame is exceedingly skinny, you can buy Command™ Narrow Picture Hanging Strips! They only are rated to hold 3 lbs. each, so you would need 32 strips, which would cost $32.08 plus tax, but you can sleep well knowing that your strips are specially made to fit your skinny frame needs. ◊

Somebody Set Us Up The Bomb (???)[1]

Or how the proposed officer restructuring would cause lasting harm to the chapter

by Pritpaul Mahal

Introduction

Unless something has changed since this writing, today you will hear (or have heard) a presentation on restructuring the officer corps.

First, some disclaimers. I want to make clear up front that I respect the authors/proponents of the proposal, appreciate their contributions to the chapter over the years, and have no doubt that they have only good intentions of helping the chapter with this proposal. However, I believe they are sorely

mistaken, and am writing this article to explain why. I acknowledge that my terminology in the article and especially the headline is drastic/dire. Part of this (e.g. the headline) is for effect, but a lot of it is because I believe this proposal has the potential to cause significant harm.

Some people will probably think that I am opposed to this proposal simply because I don't like change. I will freely admit that I am generally of the "if it ain't broke don't fix it" school of thought, and my opposition to proposals is often because of that. However, in this case, my concerns are much deeper than that. I know it's long[2], but I hope you will take the time to read this article and consider my points carefully.

The Proposal

I was hoping to provide a detailed and fair summary of the proposal in this section for the benefit of those reading my article without the context of the presentation. However, I appear to have run out of time (no, I didn't write the article linearly!). Let's just say that the idea is to introduce hierarchy into the officer corps, which 7 or 8 officers that report directly to the President and attend the main officer meetings, with around 3 of them having 3 or so officers each under them organized by function. These "officer subcommittees" (my term) would have their own meetings and pass reports and communication up through the "lead officer" (again, my term, I'm not sure how the proposers term these things) to the rest of the "top-level" (my term again) officers.

The Problems

Introducing hierarchy to the officer corps presents several fundamental problems. These include a reduction of information flow and communication, decline in morale, increase in overhead, and elimination of important leadership transition mechanisms. All of these are problematic individually, and combined threaten the strength of Michigan Gamma.

Communication

One of the great things about the officer corps as it currently stands is that at an officer meeting you have 15+ people giving their input on matters important to the chapter. While this may sound superfluous, in my experience this certainly adds to the strength of our chapter as more ideas are considered, and these ideas are vetted more carefully. The fact that people are able to contribute to and hear about areas of the operation of the chapter beyond their own little niche is a feature, not a bug. This helps improve the continuity of our operations and the motivation of officers (see sections below).

A rebuttal I've heard to this argument is that while increased communication is great, having too many people in the room leads to a situation where either meetings take too long or people are afraid to speak up about things because they're worried about making the meeting take too long. The thing is, what happens in reality is that the officer meeting is an overview of everything going on in the chapter. The important things do get discussed, and the meeting generally stays within the allotted time. If something does need to be discussed in more detail, it inevitably gets moved to another venue. Usually this is just a short get-together after the officer meeting, but sometimes it is a separate meeting. In either case, because the issue has been discussed briefly during the general meeting, officers with ideas and opinions to contribute (regardless of how related or unrelated their position is) are aware of the general gist of the discussion and can then choose to attend this follow-up.

Somebody Set Us Up The Bomb (???) (cont'd)

One might suggest that a general announcement could be sent out about these "mini-meetings" so that those interested can attend. This is impractical for 2 reasons. First, it is difficult to gauge your own interest in a topic without having had a brief discussion first. The second is that many of these "mini-meetings" are in fact very short: just a 5-minute discussion after the officer meeting. Trying to schedule these separately would be impractical, and the need for many wouldn't be known until the issue comes up during the main meeting.

Another counter-argument is that all officers (and indeed any member) would still be welcome to come to officer meetings. While technically true, this is not likely to happen for reasons discussed below

In short, we would end up with a smaller group of people that are able to give a little more input on issues that they may not necessarily have strong feelings about, as opposed to a larger group of people that are able to contribute to discussions about things that they feel strongly about. This takes us to my next concern.

Morale/Culture

Another great thing about the chapter in general, and about the officer corps, is our open and welcoming culture. People who want to take an important leadership role have many avenues, including the officer corps which requires a large amount of dedication and effort, but also provides a significant level of recognition and influence over the direction of the chapter, including in areas unrelated to the particular officer position. You can tell people that this is only a structural change and doesn't affect their recognition or influence all you want. The fact is that while we all have exemplary character, one cannot effectively deny human nature. If I am told that I report to another officer instead of the President, and am not expected at general officer meetings, I am naturally going to feel less important, and that my participation is less *desired*.

But being an officer shouldn't be about ego, should it? That's true, but along with feeling important comes a sense of responsibility to the chapter in general (not just to my particular duties), and a willingness and desire to contribute ideas in other areas. It also leads to a feeling that what they have to say *matters*. This is one of the reasons many people prefer to work at a smaller company. How often do you hear these companies tout (including at TBP meeting presentations) the fact that their hierarchy is flat and has less layers, and that people are more able to contribute to the direction of the company? They tout this because it actually is important to people and attracts better candidates who want to make a difference, just like it currently attracts candidates to our officer corps. Introducing hierarchy will make our currently occasional problem of not enough candidates much worse. (It will also as a practical matter limit more positions to people who have some experience being an officer, sorry I don't have time to detail how in this article.)

In effect, what we would really be doing with this proposal is taking the misnomer "officer core" that people often mistakenly use and that bugs me, and really in fact be turning our officer corps into an "officer core" plus some other officers. This "officer core" effect also has the danger (hopefully avoided, but still possible) of forming more "cliques" of power that limit openness to others. (Again, I don't have time to get into this, and I actually hope/feel that given our character requirements this wouldn't actually be a problem, but it's still a danger... I don't want us to be like HKN's officer corps)

We can say that officer meetings will still technically be open to all officers. The fact is, however, that that will not change the perception of being more closed, people who are not really "supposed" to be there will be less likely to actually feel like their opinions matter enough to come. On a practical level, we would be expecting "non-core" officers who do still have the motivation to participate after effectively being told they don't matter, to spend extra time in order to do so because they would have to come to the general officer meeting in addition to whatever "branch" meetings. This will unavoidably reduce attendance at the general officer meeting. My understanding is that this is actually one of the goals of the proposers. However, as discussed below, lower officer participation is actually a significant negative, not a positive.

Continuity and Idea-Sharing

One of the great strengths of our chapter, and in fact, the key to our strength, is our strong transitions compared to many TBP chapters nationwide and to other societies here at U of M. In fact, we are often asked to come to round

Somebody Set Us Up The Bomb (???) (cont'd)

table discussions to help other organizations learn from us on this topic. What gives us this ability? While there are many factors, including the motivation of our members and the size of our chapter, I would argue that one of the biggest factors is the size of our officer corps.

Having so many people involved and invested in the day-to-day running of the chapter, hearing what other officers are doing for their jobs, greatly increases the "safety factor" of having someone who will recognize that something important has been left undone or who will know how the details of how a particular task is done. In sitting in on officer meetings, I often notice instances where somebody who has been an officer for a while is able to fill in details that a new officer may not know.

Introducing hierarchy to the officer corps, especially in the manner proposed, significantly negates this advantage. This will happen on both a cultural and a practical level. Officers who do not feel like a part of a larger cohesive body are less likely to feel a need or desire to be informed of the workings of other "branches" of the officer corps tree (see Culture section). On a purely practical level, officers who are not present at a meeting are unable to pick up details of what others are doing, or to fill in details that they know when they see that they are missing.

Perhaps of a bit less immediate significance, but still very important, is the fact that the current model also helps officers transition more easily and effectively into new roles because they have some level of knowledge about all positions. While we welcome and encourage "new blood" on the officer corps, it is also important to have some continuity in officers that are familiar with many aspects of many positions just from having been there, not necessarily from having done every single positions. Advisors are able to fill some of this role, but only because they have over time (starting as officers) gained the knowledge of most positions that the current structure gives them.

The current system is frankly not perfect on this front, in that we sometimes lose a large chunk of experienced officers. In fact, there was one semester in recent memory when we really pushed for non-officer members to come to officer meetings to try to gain experience precisely because we were going to be losing a lot of experienced officers to graduation. Cutting down on the number of experienced officers, however, does not help this problem but just makes it worse.

Benefits?

I should briefly (or at least that was the plan...) address the supposed benefits of the proposal. The main ones that I have heard put forth are that it reduces the management workload of the President, that it is more consistent with the overall structure of the rest of the chapter, and that it keeps the size of officer meetings more manageable.

First, the workload on the President. After all, one of the proposers is a past President. I admire the goal of reducing his/her workload because as we all know, our Presidents do have a lot on their plates. However, I think the workload reduction that this proposal achieves is minimal if any, and may actually have the opposite effect by adding more overhead and bureaucracy to communications. The fact is that in general, most decisions are either of a nature that the officers themselves can make them, or are intertwined enough with the operation of the rest of the chapter that the President needs to be involved. I admit that there are probably a few areas in which the "top tier" officer is able to provide guidance, but in practice these will be few and far between. In practice what we will see is, depending on the boldness of the officer in question, either them skipping the middle layer and asking the President directly, or involving the middle layer, still requiring a response from the President, but adding an unnecessary delay. In either case, the President will often need to be involved anyways.

Where this proposal may actually be helpful is in reducing the amount of "double-checking" the President needs to be doing to make sure things get done (though that introduces problems of its own[3]). However, in the end the President will still need to have at least some level (though likely reduced) of keeping tabs on everyone, including the "second tier" officers.

More overhead is also introduced in that important matters need to go back and forth between different meetings and/or e-mail lists to get things fully fleshed out, taking more time from everyone involved, including the President.

The proposers have probably shown you a diagram of the overall structure of the chapter that includes other people

Somebody Set Us Up The Bomb (???) (cont'd)

reporting to officers. They contend that this shows that restructuring the officer corps to also include more reporting relationships will be more consistent. However, what they neglect to mention (or consider?) is that all of those relationships they show are of chairs who have very specific and – this is important – time-limited tasks such as running a specific service project or social activity. Unlike officers, they are not involved in the sort of semester-long or year-long running of the chapter that requires coordination with other officers. I unfortunately don't have time to go into a more detailed explanation of why this is fundamentally different right now, but I hope the gist comes through.

On to size of officer meetings. The proposers probably showed you a picture of a very crowded officer meeting. It probably even got some chuckles and some comments from those who had to sit on the floor or stand for that entire meeting. I, however, honestly don't see the relevance or point (other than to gain those chuckles or distract from the main point) of showing a picture of one meeting that was held in a much smaller room than usual. If they showed a picture of one of our meetings in the current room they are held in, you would see nothing unusual or interesting. I think the main point however that they intend to make is that large officer meetings are less productive. I fundamentally disagree with this and think/hope I've made clear why in the Communication section above. If not, feel free to ask.

Long-Term Damage

One may wonder why I am so strongly concerned about this proposal. After all, I'm known for my general opposition to "fixing what isn't broken". Yet, I've never felt an issue to be so important that I've stayed up for a significant portion of the night and invested so much emotional energy[3] to write a (hopefully?) persuasive article about it (and possibly made Justine very angry with me for being so late and writing so much). I usually just state my opposition, maybe engage in some debate, and then let the chips fall where they may.

Why the larger than usual concern over this proposal?

The reason is that the damage from this restructuring could be significant, and more importantly, long-lasting and difficult to reverse. I realize that people may not like, or may even be offended by, my strong opposition to this proposal (given that it's coming from well-respected long-time members). However, I would be remiss in my duty to the chapter if I decided to just "let it be" in this case as I often do. Most decisions (for example the recent adoption of a Third Actives meeting and tiered leadership) can be undone easily if needed, with no lasting effects. But this proposal is different.

How is it different? As indicated above, it would cause a significant shift in the culture of the officer corps, and would also cause a weakening of officer corps transitions and continuity, and as a result the chapter as a whole. Recovering from a one-time weakening of the chapter would become a long-term project as we would have lost the smooth continuous "flow" cycle of leadership transitions that keep things running so smoothly. Therefore, it becomes not just a matter of "it's not working, let's repeal it", but a process of re-introducing the smooth flow, institutional knowledge, and culture that has been built up over time. True, this would not kill the chapter in a single semester. The first semester will seem to mostly run just fine. But problems would also not be very apparent until they become bad enough that they are difficult to recover from. Furthermore, if the cliques that I am afraid of do indeed form, there would be a form of institutionalized resistance to changing back.

Am I being over-dramatic? I really honestly don't think so and hope I've gotten my point across well.

Conclusion

Introducing hierarchy to the officer corps will be deeply harmful to the chapter. The benefits, on the other hand, are minimal. While it is well-intentioned, the chapter should reject this deeply flawed proposal. ◊

Somebody Set Us Up The Bomb (???) Footnotes

1) Because I am perpetually afraid of offending people or being misunderstood, I feel a need to clarify again that I don't think anyone is *maliciously* setting up a bomb. I am just very afraid of the consequences of the proposal and also wanted to make a humorous pop-culture allusion similar to the one I expect in the subtitle of the presentation of the proposal (though perhaps I'm dating myself with the reference I chose?).

2) Sorry it's so long. I didn't expect it to be when I started writing (I expected a single page!), but there's just so much to say. In fact, I had to cut out some things I wanted to cover just for a lack of time to write them. And for me, that's a huge thing to say (see footnote 4).

3) This is actually pretty important and really needs to be a section of its own, but I just ran out of time. Basically, adding the managerial role to the top-level positions adds to the number of positions which realistically require previous officer corps. This affects multiple areas of my argument, including its impact on the open culture of the officer corps and the chapter, and negative effects on continuity and transitions.

4) I HATE and dread writing – that's one of the big reasons I didn't go for a PhD and am resisting pressure to go to law school. So it really does take a lot of energy out of me. I had actually even decided that I was going to put this off and write it later, until someone convinced me that it's more effective to present my rebuttal at the same time the main proposal is presented. I'm also just not very good at it (especially given the time pressure), so I'm sorry if this article is unclear, deficient, doesn't flow very well, or doesn't make my point effectively. The argument is much more cohesive in my head. Please do let me know if something is confusing and I'd be happy to talk to you about it and/or maybe even write a follow-up clarification article.

YouTube Video of the Week

Iggy Investigates an iPad
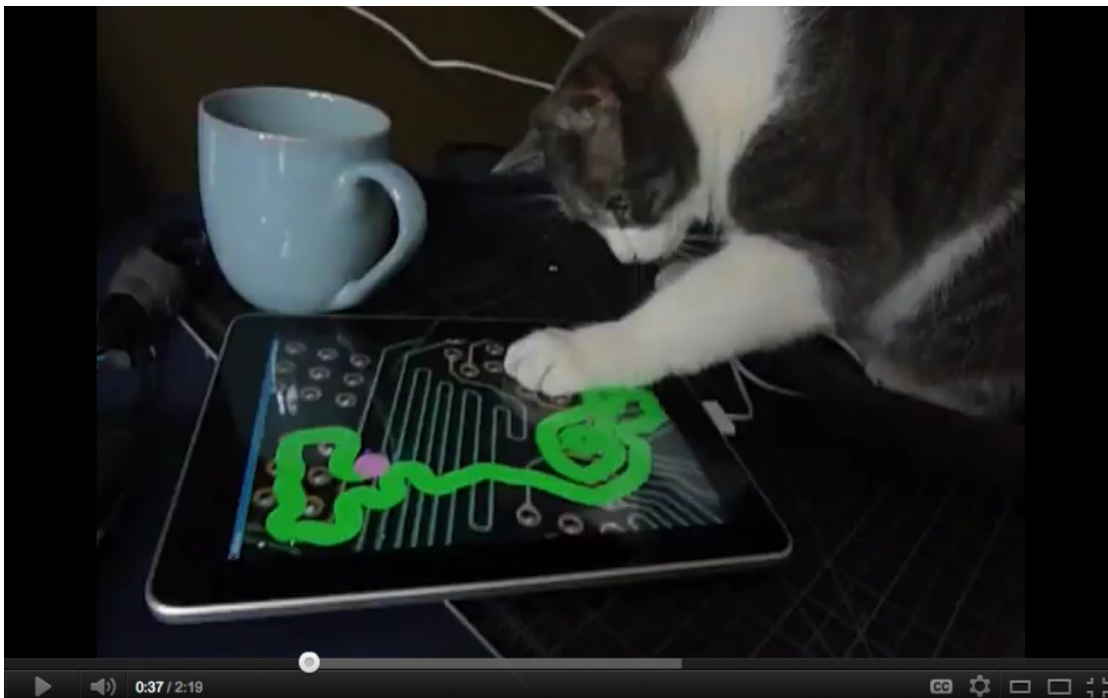
See what happens when your favorite two things mix, cats and iPads.

Concert Recommendations

Submitted by Ryan Chen

Saturday, February 11, 8:00pm University of Michigan Jazz Festival, Rackham Auditorium

Free – no tickets required

Featuring Sean Jones (trumpet) and Curtis Fuller (trombone), the UM Jazz Ensemble, the UM Jazz Trombone Ensemble, and the UM jazz faculty.

Sunday, February 12, 4:00pm Michigan Chamber Players, Rackham Auditorium

Free – no tickets required

UMS presents the Michigan Chamber Players in two free concerts each year to highlight the talents of faculty members in the University community. PROGRAM: Brahms – Liebeslieder Waltzes, Op. 52; Kern/Hammerstein – "Make Believe" from *Showboat*; Bock/Harnick – "Do You Love Me?" from *Fiddler on the Roof*; Lloyd Webber/Hart – "All I Ask of You" from *The Phantom of the Opera*; Brahms – Clarinet Quintet in B minor, Op. 115

Thursday, February 16, 8:00pm UM Faculty Showcase, E.V. Moore Building – Britton Recital Hall

Free – no tickets required

Performers include Arthur Greene (piano), Fritz Kaenzig (tuba), Joseph Gramley (percussion), David Jackson (trombone) with trombone quartet, Yitzhak Schotten (viola) and Katherine Collier (collaborative piano), William Campbell (trumpet), Jeremy Edwards (PAT), and Stephen Rush (PAT).

Friday, February 17, 8:00pm Symphony Band Chamber Winds, Stamps Auditorium

Free – no tickets required

Mozart's largest and most complex serenade vividly illustrates his genius. Imagine the surprise felt in courts long ago as the sounds of this endearing work were heard for the first time in all of its "rule breaking" glory. Gulda's Concerto for Cello, featuring award winning U-M doctoral student Paul Dwyer as soloist, is no less adventuresome in mixing styles that range from Mozart to Motown. PROGRAM: Mozart – Serenade No. 10, "Gran Partita"; Gulda – Concerto for Cello and Wind Orchestra.

Sunday, February 19, 8:00pm A$AP Rocky with DJ Graffiti, Blind Pig

Tickets at www.blindpigmusic.com

Fresh from a $3 million record deal with Sony/RCA and the release of his mixtape LivelLoveAAP, AAP Rocky is an up and coming rapper hailing from Harlem. He has been featured on songs with artists including Lloyd Banks, Smoke DZA, Schoolboy Q, and 2 Chainz.

Tuesday, February 21, 8:00pm (Pre-concert lecture at 7:15pm) University Symphony Orchestra and University Choirs, Hill Auditorium

Free – no tickets required

Musical forces join together for Carl Orff's seminal masterpiece Carmina Burana. One of the most famous musical compositions of the 20th century, the powerful musical settings of texts written by monks and students in the 13th century still ring true today: the fickleness of fortune, the fleetingness of life, the primal thrill of the return of spring, and the pleasures and perils of lust, drinking, gambling, and gluttony. The program will also include a concerto performed by one of the winners of the School of Music, Theatre, & Dance's concerto competition. ◊

Puzzles of the Week

Crossword

Team Swag has put together the best of the best in engineering terms, pop culture references, and Michigan facts for possibly the most incredible crossword you might never solve.
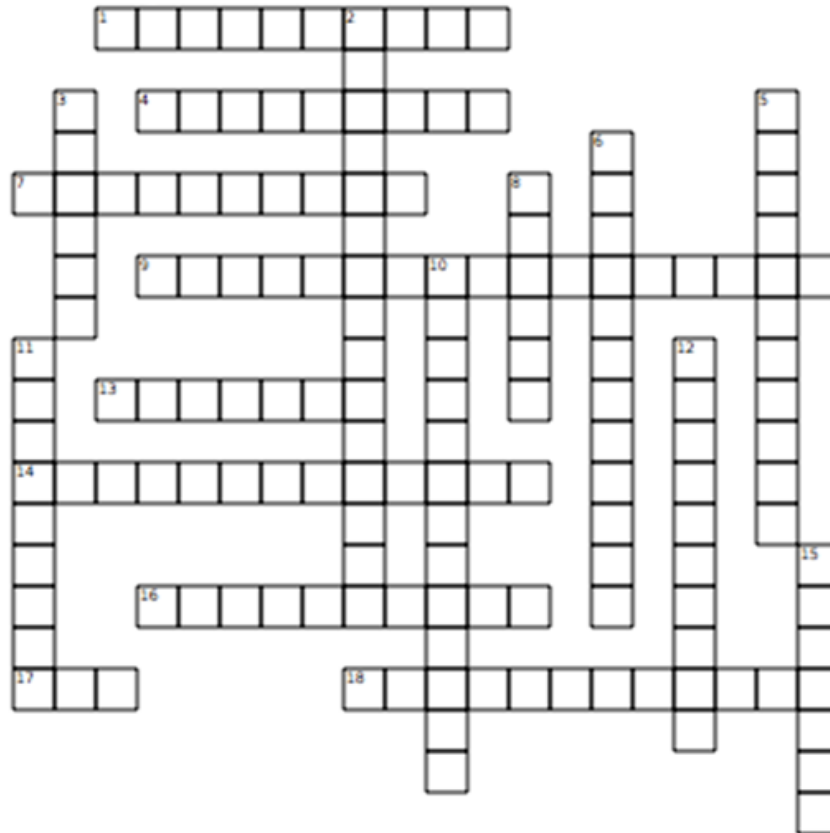
Across

1 michigan wide reciever in this year's super bowl
4 "Let me put it on my wedding board!"
7 profession of the diag harmonica/washboard guy
9 crystal structure with a packing fraction of 0.68 (3 Words)
13 a way an object can be invoked or called as if it were an ordinary function
14 name of a film director/actor and gorillaz song (2 Words)
16 Kelvin is to Celcius as Rankine is to _____.
17 "Don't go chasing waterfalls"
18 2010 british boy band (2 Words)

Down

2 9 member k-pop group (2 Words)
3 swedish DJ and producer
5 this boy band features 4 hockey players from Minnisota (3 Words)
6 "Medium pepsi, my friend?" (2 Words)
8 dance move involving leaning back and swinging your arms
10 lemme smang it (2 Words)
11 sorting algorithm that uses a pivot value
12 tensional integrity or floating compression.
15 memory leaks are usually caused by poor _____ management.