CSC 595 - Research Skills

Time Management

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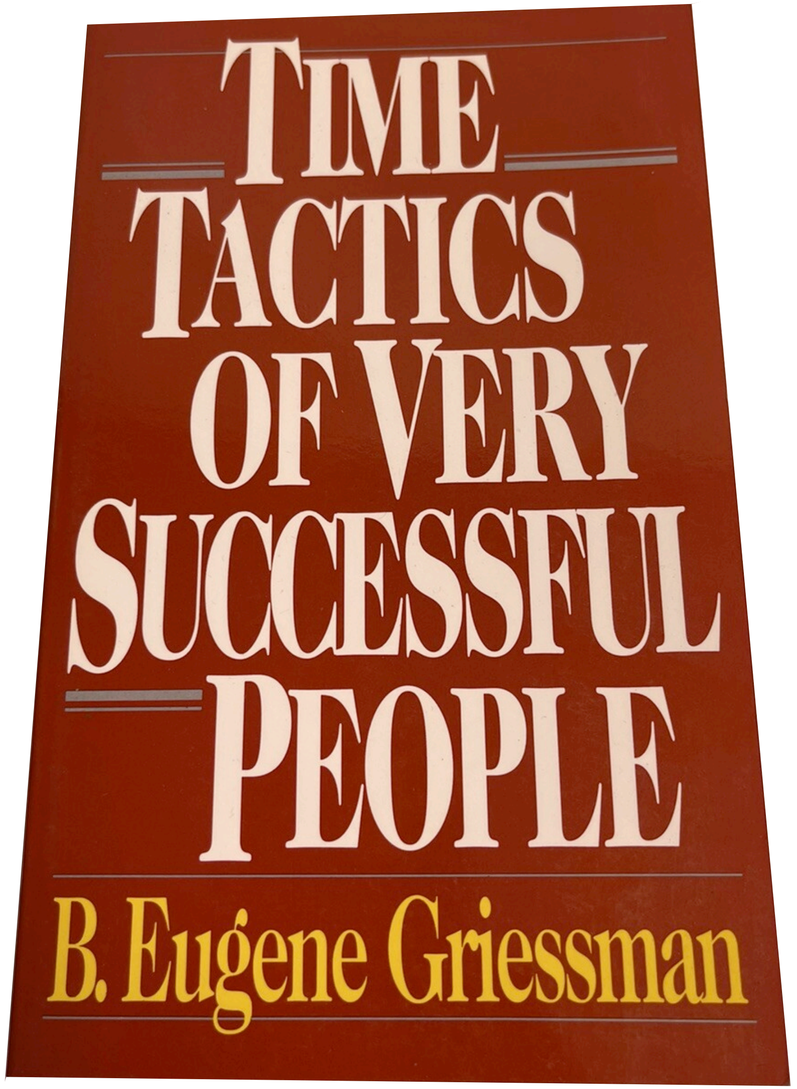
Time is precious

- Time is a rare resource: once you use it, you can never get it back
  - “Time flies like an arrow; fruit flies like a banana”

- “The difference between being successful and not being successful depends on how you use your daily ration of 24 hours.”
- Spending more time improving your knowledge/skills or putting more time into a problem can give an *exponential* increase in your research productivity
- Therefore, spending a *given* amount of time more efficiently can give a similar increase. Result: “effective” amount of time becomes larger.
- So, let’s talk about concrete strategies for managing your time well

A “must read” book



Read it for free on archive.org

Spend Time Purposefully

- The first thing to note:
    - Make sure all time is spent purposefully. All time has value. This includes your ‘leisure time’, which is for leisure, not work!
    - Implication: There is no such thing as ‘free time’. “Sure, I’ll review your draft in my free time (and oh, it looks like I’m not got going to play badminton now).”
- The above also applies to time spent working. “I’ll work from 10am - 6pm” is a fuzzy plan and susceptible to being filled with things that aren’t important for you (things that might actually be tasks of *other* people!)
- To make work time purposeful, be concrete on what you will be doing throughout the day
- Q: So, for that time when I’m working, how should I spend it?
- A: I need to figure out my priorities

My “A” list

- Figure out your really-long-term goals. Things like:
  - “I want to be a professor”
  - OR “I want to be an industrial researcher doing UX at Microsoft Research”
  - OR “I want a startup that will be bought by Google”
  - (or “I want to buy Google”)
- Note: goals are not enough.
  - Need crisp (not fuzzy) goals to work out a plan to achieve your goals.
  - Compare “I want a high paying job eventually” vs “I want to be at Meta in 5 years.
  - Backward planning is a great strategy, but it requires crisp goals.

My “A” list

- From your very long-term goals, create (somewhat smaller) long-term goals. Try to figure out what you’ll need to achieve your goal. Visualize the type of people that get those positions. Work backwards. What do you need?
    - Note: when your very long-term goal is to target a prestigious position, the somewhat smaller, long-term goals may still be very large, like “I need to be recognized in my field by getting 3 strong papers in my area”).
    - Don’t forget your really-long-term goals (and revisit them occasionally), but the (smaller) long-term goals are what you’ll think about more often

My “A” list

- For each long-term goal that you can do this for (e.g., your first paper), create sub-goals. Each sub-goal should be tangible, meaning the tasks are approachable.
- Put the highest priority sub-goals on “A” list (most important priorities). These are generally the sub-goals that feed into your long-term goals. They should not be too massive in scope.
    - Scenario 1 - Research is in the early phase. Subgoals: “Work on formalizing the problem.” “Come up with a first algorithm to get my feet wet”. “Skim fundamental paper X to get a list of papers to look at more closely.” “Carefully read paper Y”.
    - Scenario 2 - Research is done, time to write the paper. Subgoals: “Write the first paragraph of the Introduction”. “Write the technical results section.” “Make the figures look awesome”.
- Good news: Each of those papers gets broken down into more tangible sub-goals. For first paper, prioritize its subgoals and put them on “A” list (most important subgoals).

Before going further… some advice *about* Time Management advice

- Lot’s of advice on time management out there
- A lot of it only applies to managers, or professors
- Or people that already have started their own families
  (maybe applies to some of you, but not all of you)
- What about me? I’m a grad student
- Is there advice that’s relevant for me?
  - Yes! That’s what we’ll talk about

Time for a typical grad student

- Most time NOT spent in meetings. Many opportunities for LARGE windows for research
- Occasional meetings
  - Includes meetings with advisor: super important. Need to make best use of this time to accelerate progress
- Common activities competing with research
  - TA work
  - Talks
  - Social stuff (hanging out)
  - Life stuff (groceries, meals, complaining to ISP or airline about something)
- Research activities that aren’t primarily YOUR research (mostly OTHER people’s research)
  - Chatting with labmates about their work

Time Bits

- We often have some medium priority things to do that only take five to ten minutes each:
  - Answering important/semi-important emails (including emails about scheduling)
  - TA work
    - Entering in grades for a batch of students
    - Marking an easy question for a batch of students
  - Prepping for a meeting
  - Taking a nap to recharge (but at least 20 minutes is better…)
  - Paying credit card bill

Time Bits

- “Time Bits” are pieces of time that are lying around (gaps between meetings, waiting for bus, etc.)
  - We encounter time bits all the time. Pay attention to your day, see for yourself!
- Time Bits strategy: Fill time bits with some of your 5-to-10 minute tasks
  - Bonus: Less small, annoying tasks to do later (more time for deep thinking, or rest)
  - A reason to end a meeting once the ideas are over, rather waiting for time to be over. If it ends early, use those time bits

Boost the Time Bits strategy

- Take tasks like “write the Intro for my paper” and split it into small pieces suitable for time bits
  - Write first paragraph of paper - hardest thing is to start, so just get started! (~20 minutes)
  - Dream up titles (~10 minutes)
  - Write abstract (~5–10 minutes for a first version)
- Take tasks like “solve problem X” and break it into warm-up problems (easier versions)
  - *Starting* to tackle warm-up problem could fit into time bit (again, hardest thing is to get started)

Deep Thinking - What is it?

- Deep thinking is thinking when you are at your peak. Ideal for:
  - Creative problem solving
  - Hardcore math (can be abstract, can be computations)
  - Creative writing (writing a beautiful Introduction for a paper, crafting the story of a paper)
  - Trying to understand some difficult concepts (or a difficult paper) - a form of learning

How can I find the right time to do Deep Thinking?

- The right time depends on the type of thinking
  - Writing - When do you write the best?
    - Try different times of day. See when your creative juices are flowing
  - Abstract ideas/Higher level math - When can you do that best?
- Sometimes deep thinking happens with one other person (dynamic duo brainstorming)
  - Don’t be afraid to mention the times when your brain is best. Better to be up front then be off your peak and have a poor session

What is my best environment for Deep Thinking?

- Should be free of distractions
- Usually not a shared lab room (unless you have quiet labmates that tend not to talk to you)
  - If you really want to do deep thinking in a shared lab:
    - Rational strategy: If most labmates don’t come in early, try an early schedule. If most don’t stay late, try a late schedule. Cherish the quiet time
    - Insane strategy: polyphasic sleep schedule. You’ll have hours so weird that there will be a lot of quiet time (but people may have to clarify 3pm vs 3am for meeting times)

What is my best environment for Deep Thinking?

- For some people, the mixture of many conversations of a coffee shop allows them to focus
- In good weather, deep thinking on weekends (and some weekdays, when appropriate) can happen on park benches, by the water, etc.
    - Victoria has amazing weather for many months of the year (in a good year, from late February until mid-October)
    - Bring paper/pen or a tablet… and a thermos of coffee or tea!

What are my ideal preconditions to unlock Deep Thinking?

- The importance of what you eat:
  - Heavy meal just before? Often makes people sleepy. Not great…
  - High fat meal the night before? (greasy food?) Might slow your brain down…
  - Very hungry or dehydrated? Might not be able to focus…
  - Had sugar an hour ago? Expect a crash soon…
- The importance of sleep:
  - If you need 9 hours of sleep, then do that. Extra hour of sleep (12.5% extra) buys many high cognition awake hours (50% higher thinking ability)
- The importance of exercise:
  - Need to expend physical energy so your mind can be relaxed + stress-free? Go for a run the night before (or a few hours before).

What are my ideal preconditions to unlock Deep Thinking?

General advice

(1) **Self-observe:** observe your recent past

(2) **Learn:** Learn how your habits (food, sleep, etc.) affect your brain power

(3) **Self-tune:** Work backwards from the time you want to do deep thinking. Make the habits for the previous day prepare you for deep thought. Self-tuning is one of THE most important things you can do to supercharge your thinking

How can I protect my Deep Thinking time?

- Schedule a meeting with yourself - put this meeting in your calendar
  - Sounds silly, but it really works (I “Nishant” do it too)
  - Example: “Start work on world domination plan” …
  - Remember to be precise. Pick things from A-list (subgoals, or sub-subgoals)
  - If someone wants to schedule a meeting during your Deep Thinking time, “Ah, it looks like I’ve got something else then; when else are you free?”
  - Same advice applies for other important things (i.e., things that aren’t deep thinking)

How can I protect my Deep Thinking time from myself?

- A lot of us get easily distracted
- Can become worse the more creative we are (the more we daydream, the more we wander…)
- So, I need to protect my deep thinking time from myself! (I might be my own worst enemy)
- If working on a computer:
  - Do I really need to be on a computer? Computers offer many distractions
  - Can I get by with pen and paper instead?

How can I protect my Deep Thinking time from myself?

- If I really need to be on a computer:
  - Banish the web browser - opportunity to teleport to Tokyo at a click of a button is too tempting
  - “But I use overleaf for everything!”
    - Download the LaTeX file and work offline. Easy, and fewer distractions.
      When finished, upload!
    - If you have collaborators, put a note on the file
      “EDITING OFFLINE. DON’T EDIT THIS VERSION UNTIL FURTHER NOTICE”
      (yes, people do this, and yes, it’s fine. Rarely are multiple people doing hardcore deep thinking on a project at the same time).

How can I protect my Deep Thinking time from myself?

- If I really need to be on a computer:
  - Turn off Wi-Fi
    - Some of my greatest work was done on airplanes. Why is that?
    - A commitment device (commitment to deep thinking). Small hurdles can help a lot
    - If you open browser and see you’re offline, you remember your commitment

Buffers

- Problem:
  - For whatever meetings I have, hard to gauge how long a meeting really should take
  - Meeting scheduled for an hour might take 35 minutes. Might feel pressure to draw out the meeting to a full hour.
  - Meeting scheduled for an hour might have needed 80 minutes. Forced to end meeting prematurely if I have another thing to do after the one hour slot is over
- Solution: “Buffers” strategy
  - First thing to note: Because of Time Bits, it’s ok to end a meeting earlier than expected. Time Bits can be used productively!
  - But what to do about meetings that needed more time? However long a meeting is expected to be, schedule in a 50% buffer (one hour meeting gets a 90 minute slot, 30 minute meeting gets a 45 minute slot, etc.)
  - If one hour meeting truly takes one hour, you have 30 minutes left over. Use Time Bits (or take a nap to recharge!)

How can I *create* more time?

- Can recover some time from your 24 hour ration by saving some time stolen by some “time thieves”
- Two famous time thieves (in some sense): emails, and marking
- Solution? Gamification. Wait, what’s gamification? How do I do that?

Gamification: make mundane tasks a game to accelerate them

- For tasks (like emails), make a game out of saving time
  - Give an estimate for how long it might take to respond to an email
  - See if you can beat the estimate
  - Try batching three annoying (but not too thought-consuming) emails and see if you can knock them all out in 15 minutes (not enough time for deep thinking, but now you're free of three annoying tasks)
- Making something a game can create fun where you never expected it
- If you're a TA, try doing this for marking homeworks or exams
  - But remember, quality also matters! "The race isn't won if you destroy the track." -NM

How can I create more time?

- Make the best of your downtime. Do downtime things when other people aren't doing them. Groceries off-peak, coffee shop off-peak, lunch off-peak, driving outside of rush hour
- See if there are hidden uptime slots. Waiting to meet doctor? Bring a paper to read, or tablet for creative work (or even laptop for starting to write Introduction to that paper
    - No one will rob you in doctor's waiting room…
      … but "In USA, medical system robs you!" – NM
- Before sleeping, focus on a problem you have been working on. You may well wake up with fresh insights or even a solution!

Batching

- Sort emails in a batch (for 1 minute things, just respond since it took 30 seconds just to figure out what it was anyways; for 5 minute things, maybe worth batching them)
- Process emails in a batch, but
  - Avoid spending over 45 minutes on a batch; time could have been for deep thinking
  - 15 minutes might be a good window for doing some “batch processing”
  - If you truly must use a larger block of time for batch processing, try to gamify it. Make it a race against the clock. You’ll finish faster!
- Do grading in mini-batches, and for a particular question, sort exam papers by type of solution. Knock out one question at a time, or one type of solution for a question at a time (avoid context-switching)

Limits

- Limit how much you take on. Conference reviewing: beware you might get assigned to review 6 papers (not tenable for most grad students); request a reduced load (suggestion: max 2)

- Don’t feel bad about not responding to emails right away. People will adjust when you take longer to respond. (but don’t leave co-authors hanging during a paper deadline, and be on the lookout from important emails from your advisor)

Beware of Time Thieves

- Beware of Time Thieves:
  - Browser, Email
  - Colleagues that ask too many questions; if you can, try to teach them how they might resolve some things themselves.
    - This makes them stronger too
      (very helpful to both of you if you are labmates!)
  - People asking to talk out of the blue
    - For a labmate:
      “Let’s talk in 15 minutes? I’m intensely focusing on something.”
    - For someone you don’t interact with often:
      “Let’s schedule some time for a chat?”

Closing advice

- “Work smarter, not busier”
- Look for easier/lazier ways to do things. Don’t confuse busyness with productivity.
- Always carry around a notepad. Jot down ideas when you have them so you don’t spend time remembering them later.
- “It is necessary to be slightly underemployed if you are to do something significant.”
  — James Watson
  - Translation: your mind needs to be relaxed, to be able to wander, to form connections that lead to big ideas. Busyness for no purpose (streamline your process) can block this state of relaxation and block the ability to have time to think deeply (which may seem like daydreaming at times)