Studying Personal Information Management as a Dual-Task Scenario

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Scenario

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- *You are working on some project*
- *(realization)* I have to email something to my boss today.
- *Switch to email & 20 mins later...*
- *Switch back to work...*
- (*confusion*) *What was I doing?*
- Oh %$#@, email to my boss!
- *Switch back to email.... (repeat?)*

Problem: EBH*

- Email program is a compact mass that *deforms spacetime* (particularly time)
... where nothing can escape once you cross the *event horizon* (activate the email program)

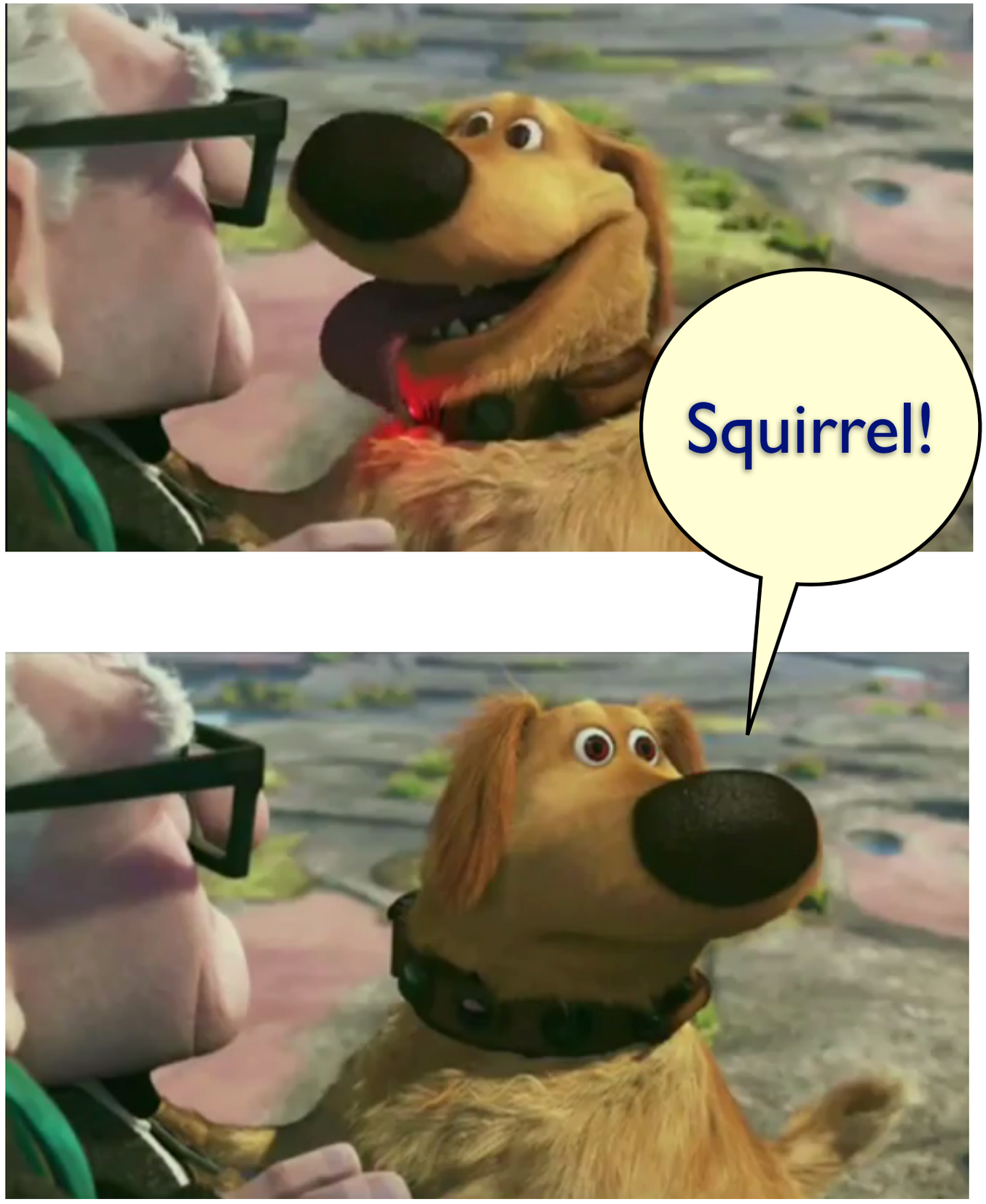
* Email is a Black Hole

Reality is ...

- There is nothing wrong with email ... other than it has poor support for:
  - Prospective Memory
  - Attention Management
  - Minimizing the Cost of Interruptions
- In other words: email is a *secondary task* to our real work (*primary task*)

Our problem

- Human attentional system is very fragile



- Much like the dog in the movie Up

* images from Pixar's Up

My Thesis Today is ...

- Most PIM tasks are a *secondary* task to a *primary* task (in a dual-task setting)
  a) There are exceptions: *Spring Cleaning* of my files is a *primary* task
  b) Morning routine to do 30 mins of email is *primary* task
- With what we know of dual-task scenarios,
  a) how can we inform PIM research?
  b) how can we improve our PIM activities?

Informal support: attention

- Informal Observations of work
  a) Getting lost on email
  b) "postpone" work on email (procrastinate)
  c) duality of email/task management
- Observations of new interface designs
  a) Quick capture
  b) Full-Screen Apps
- Productivity Gurus (e.g. David Allen's GTD) address mental load more than organization

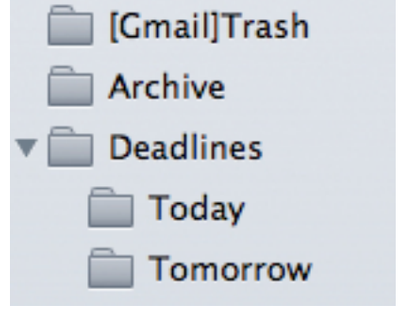
Some Observations: Inbox

- People get distracted by leaving things in inbox
  a) Reduce distractions (hide things)
  b) Reduce time to check new emails
  c) Inbox-0

- What to do with things to be handled later?
  a) leave in inbox and pay price of revisit
  b) capture and move elsewhere (task manager)
- High variability among individuals

Procrastinate*

- What if we could push email away and have it come back *later*?



- Tag emails with future date
  - we support relative dates (tomorrow, friday) and absolute dates (3/23)
- Deamon runs at 5am and checks emails postponed for *today*
  - Move email back to inbox and mark it unread

* Presented at 2012 PIM Workshop

Procrastinate: Initial Observations

- Pros
  a) Nice match with prospective memory
  b) No new interface required; supports all devices
  c) Combines well with threaded view in GMail
- Cons
  a) When to run the cron job is critical
  b) Adding reminders doesn't work well (new UI needed)

Distractions are a problem

- New interface designs are attempting to address this problem

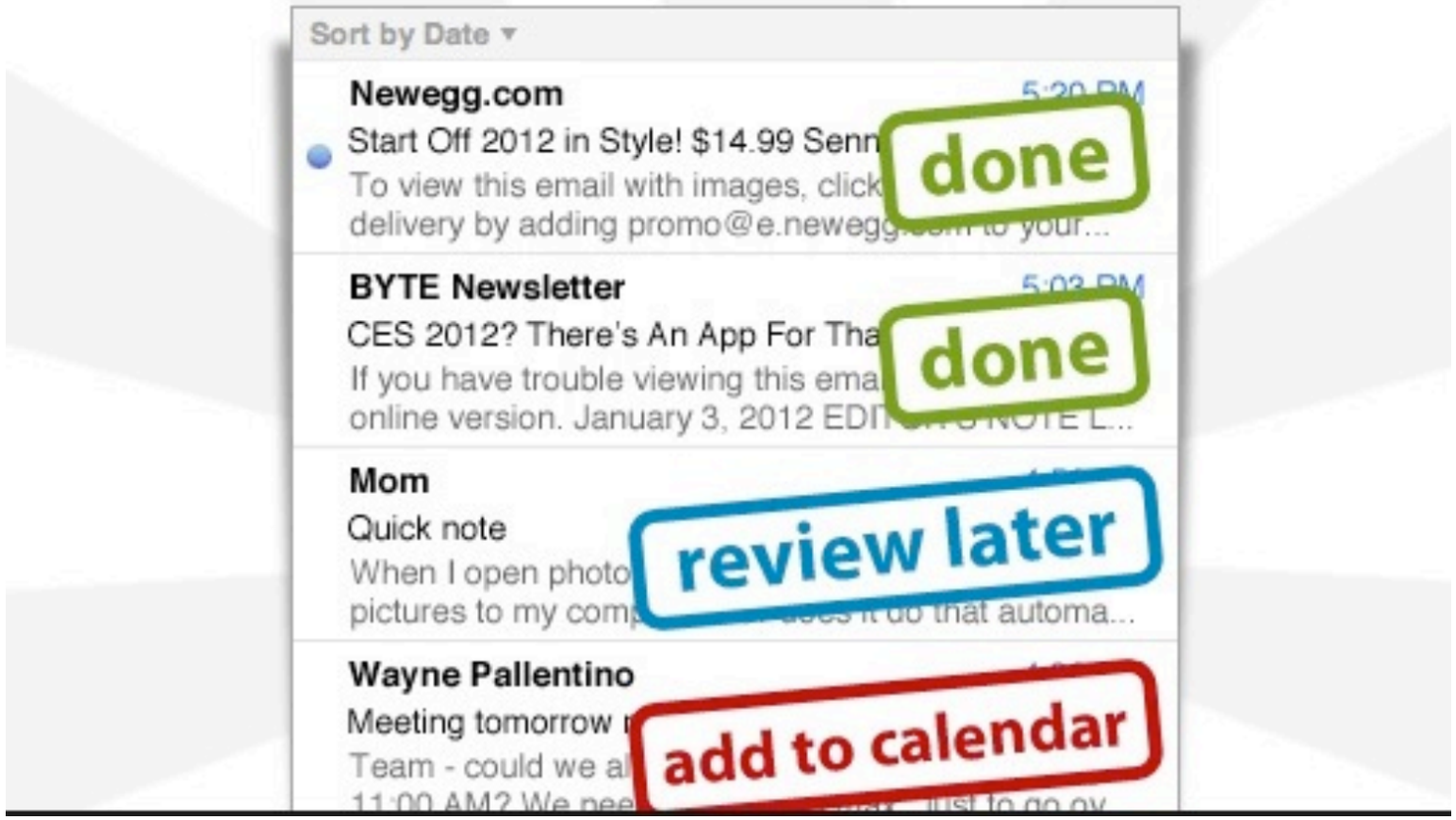
- Plenty of applications now support "Full Screen Mode"

- Apple added it to OS X Lion to "work and play without distractions"

mailpilot

Coincidentally

- Project in Kickstarter.com
- Reached their funding goal, now on development
- 2 VT students (no connection to me)



http://mail-pilot.com/

DAVID POGUE: "Ingenious" The New York Times

NADER ASHWAY: "Kickstarter of the week" WIRED INSIDER

Human attention

- Limited resources to devote to tasks
- Task switching requires more resources
- Multiple vs. single resource theory
- Performance suffers as the amount of resources required increases
- Interruptions cause a task switch (more resources), continuous interruptions cause thrashing
  - Internal (endogenous) vs. external (exogenous) interruptions

Prospective memory

- Memory of future events "I have to pick up milk on the way home"
- Four stages, relevant to PIM:

  a) Intention formation

  b) Intention retention

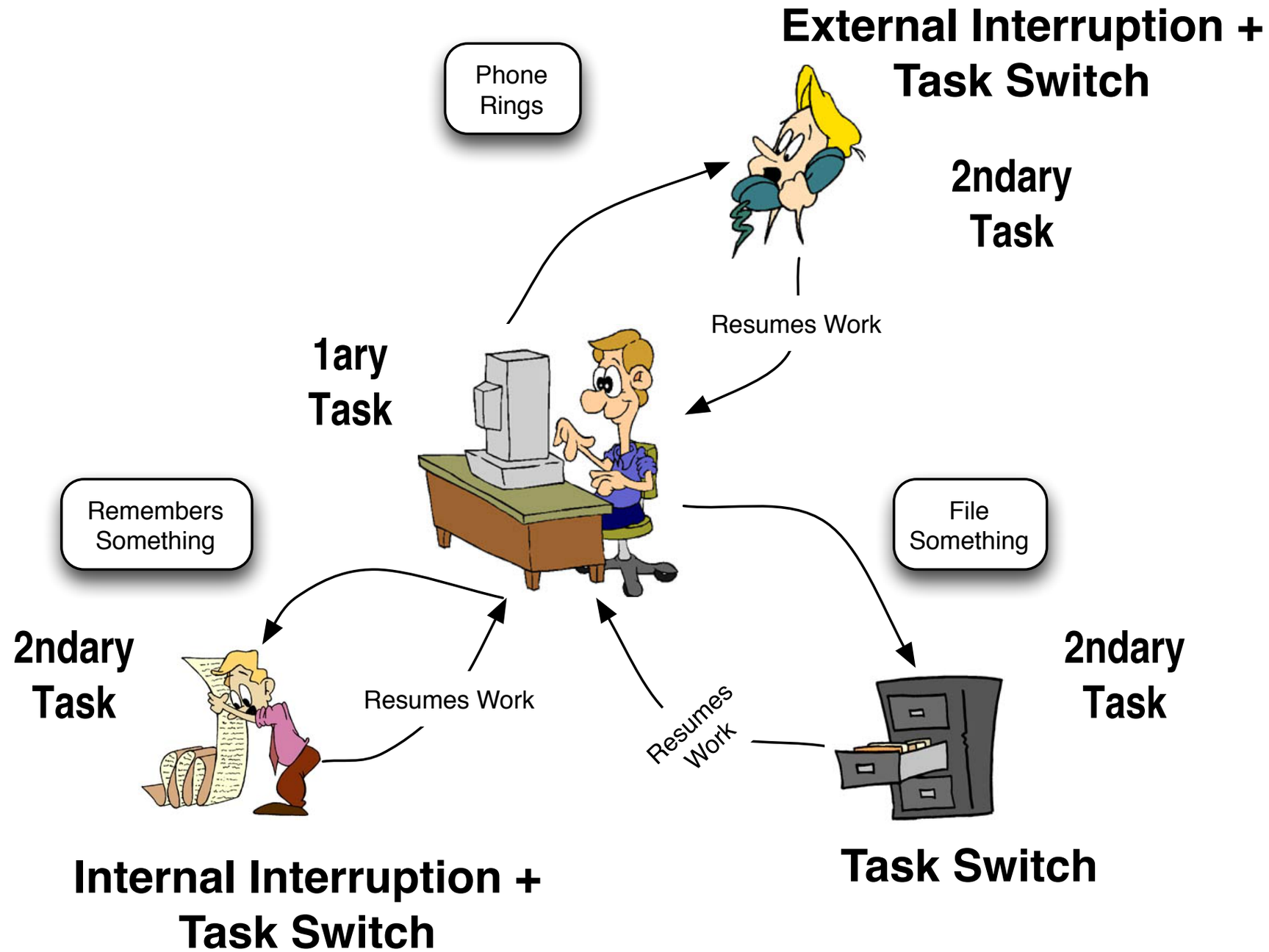
  c) Intention initiation

  d) Intention execution

Measuring workload

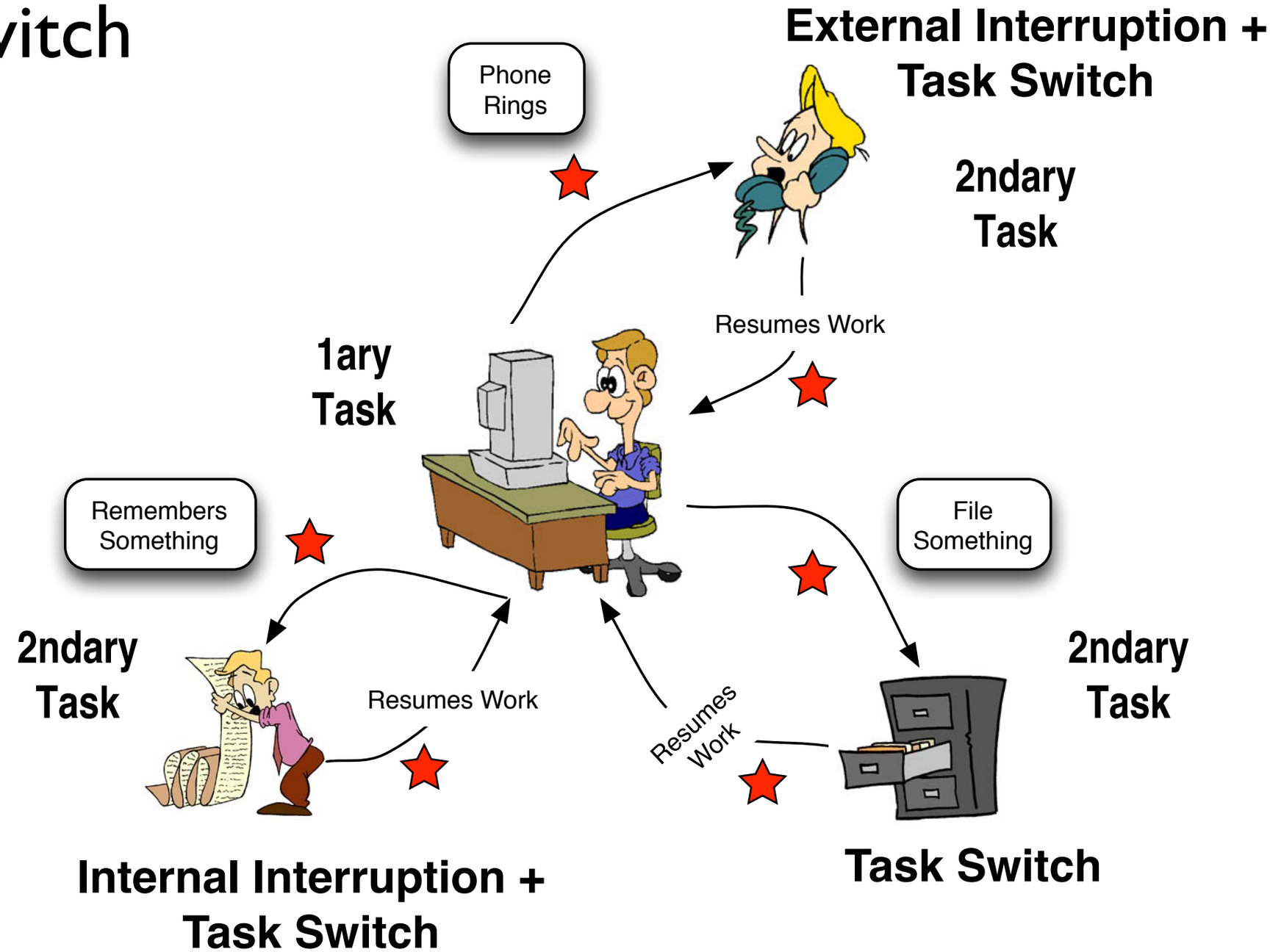
- Changes on mental workload produce physiological signals
- We can measure them as
  - Self-report (NASA TLX)
  - Pupillometric measures (eye tracker)
  - Electro-encephalograhic activity

PIM as attention hog



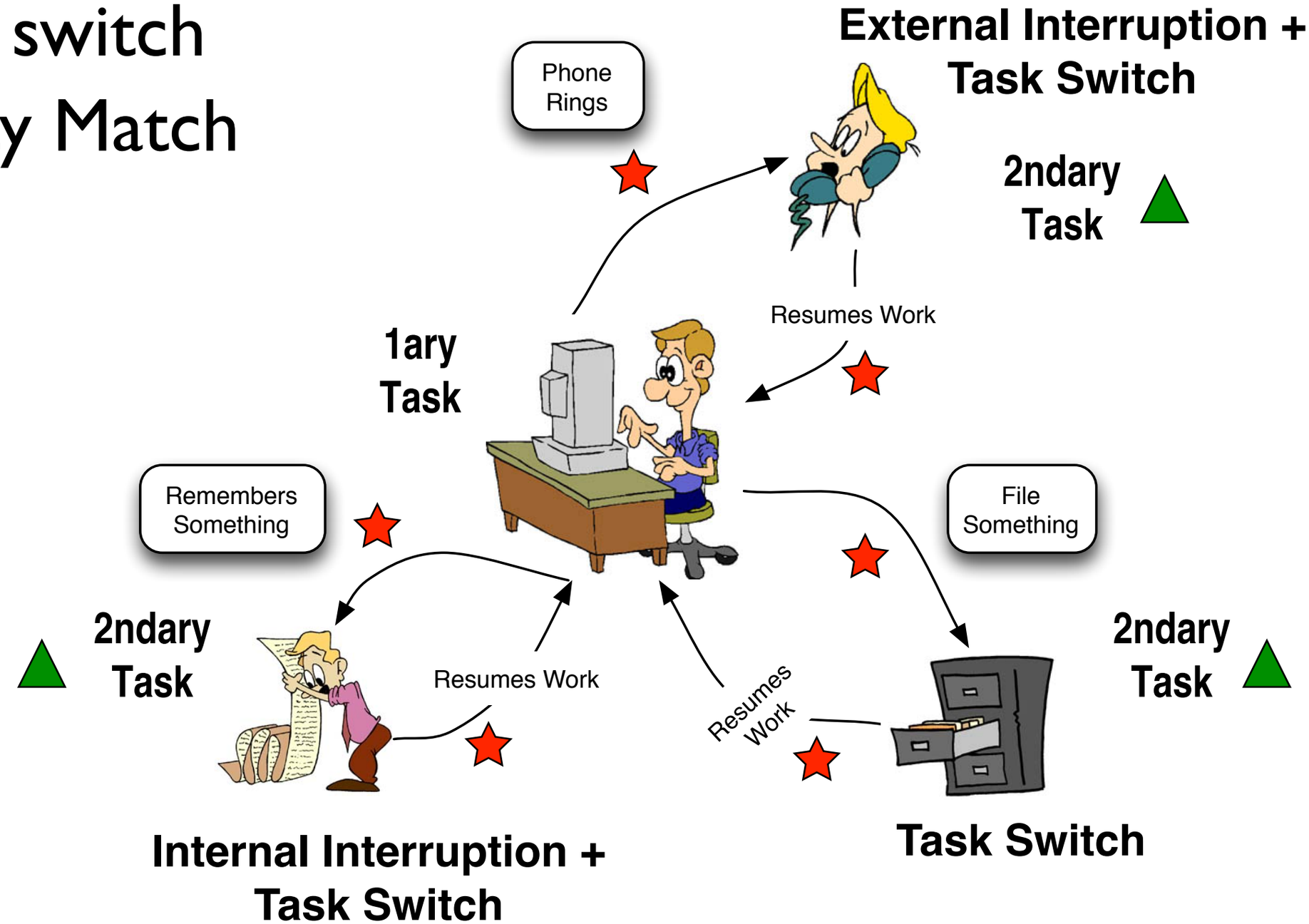
PIM as attention hog

- Cost of task switch



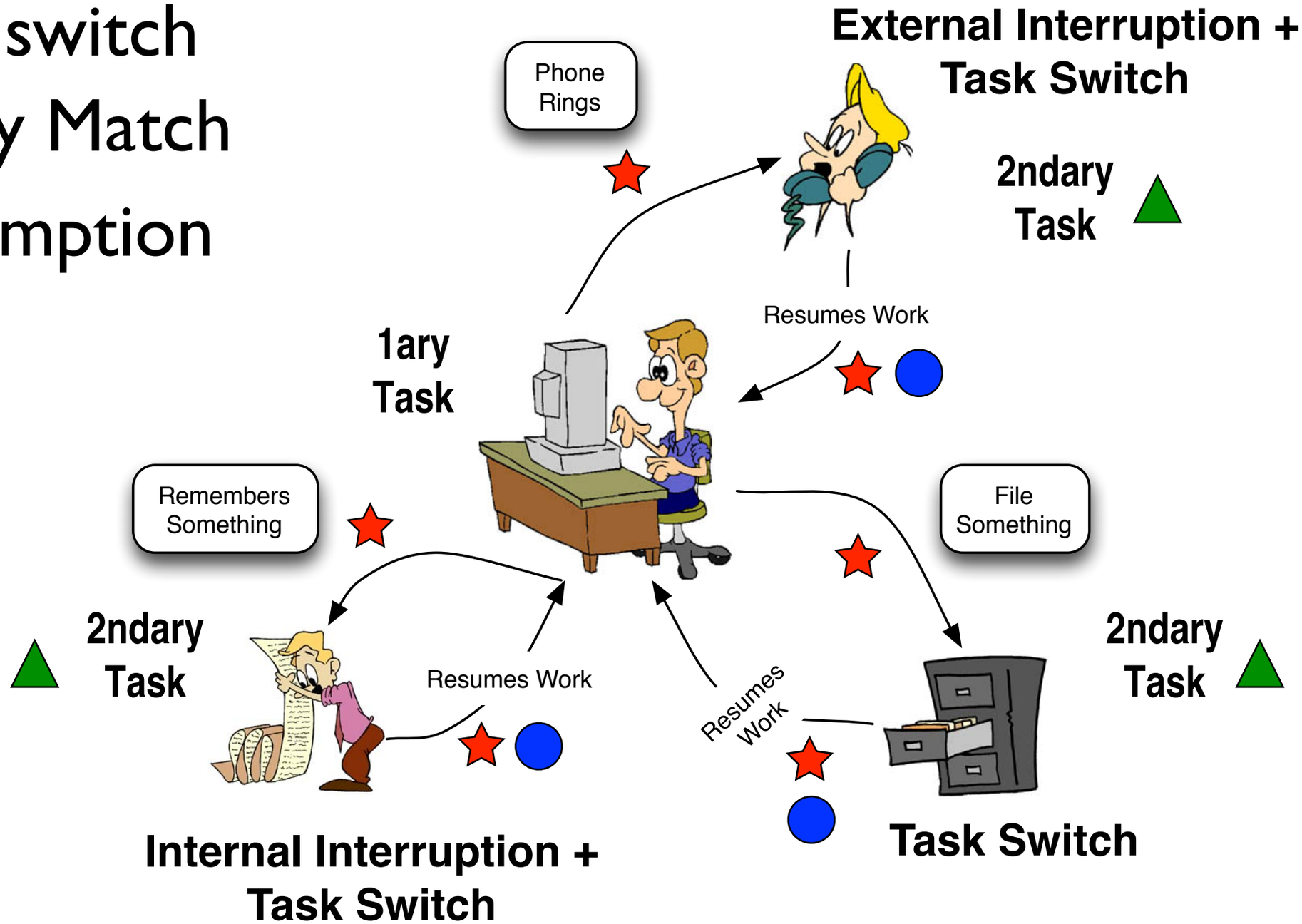
PIM as attention hog

- ★ Cost of task switch
- ▲ Compatibility Match



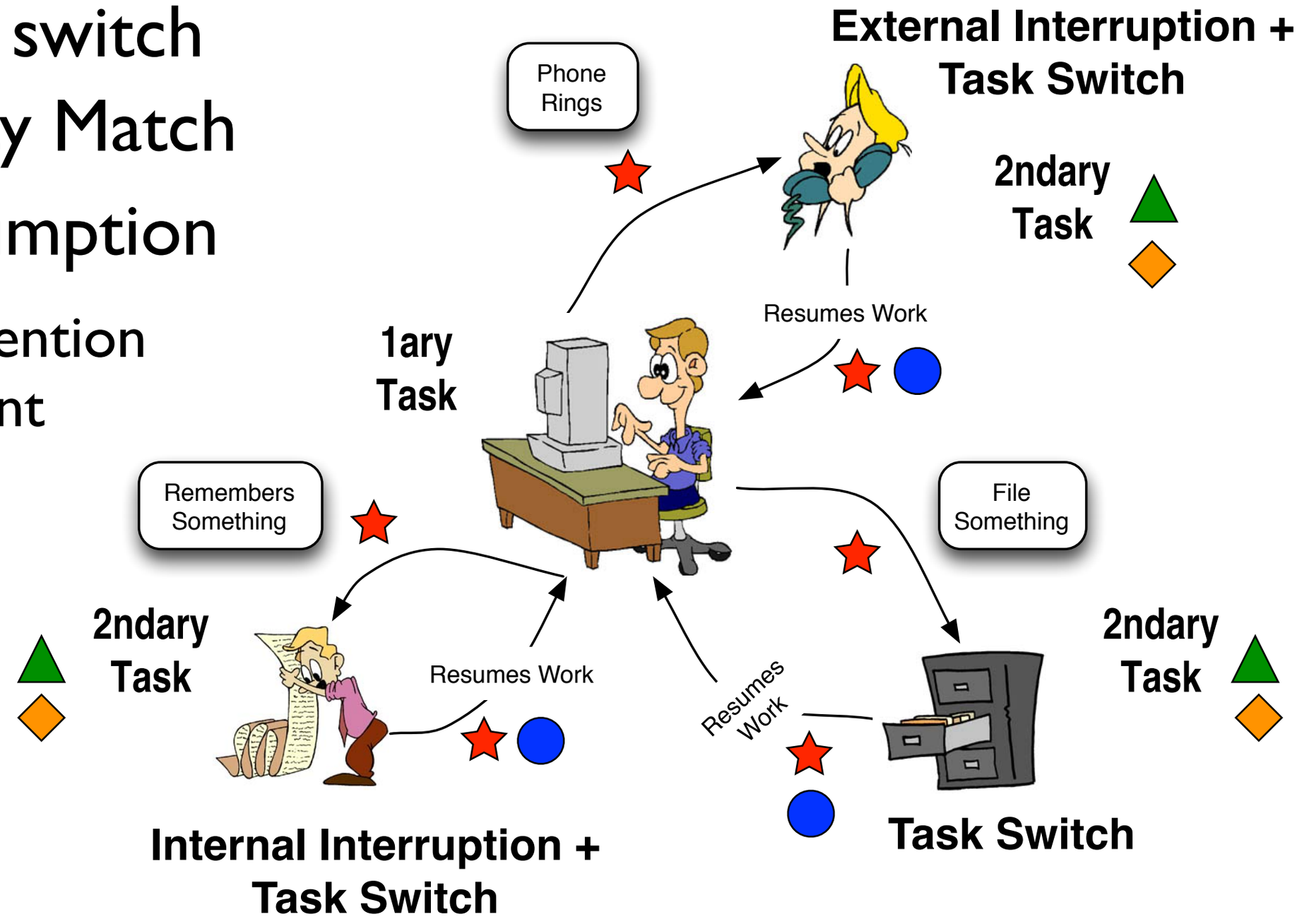
PIM as attention hog

- Cost of task switch
- Compatibility Match
- Cost of resumption



PIM as attention hog

- Cost of task switch
- Compatibility Match
- Cost of resumption
- Disruption, Attention Grab, Time spent



Research Considerations

- Can we use physiological measures to study PIM in a dual-task paradigm?
- How disruptive are internal vs external interruptions?
  a) we are not good at managing our *interruptability*
  b) presumably we can control external ones
- Can we help reduce the workload in interruption through interface designs?
- Are the solutions global (e.g. Voida's work) or local?

4 Practical Considerations

1. Reduce Attention Grab

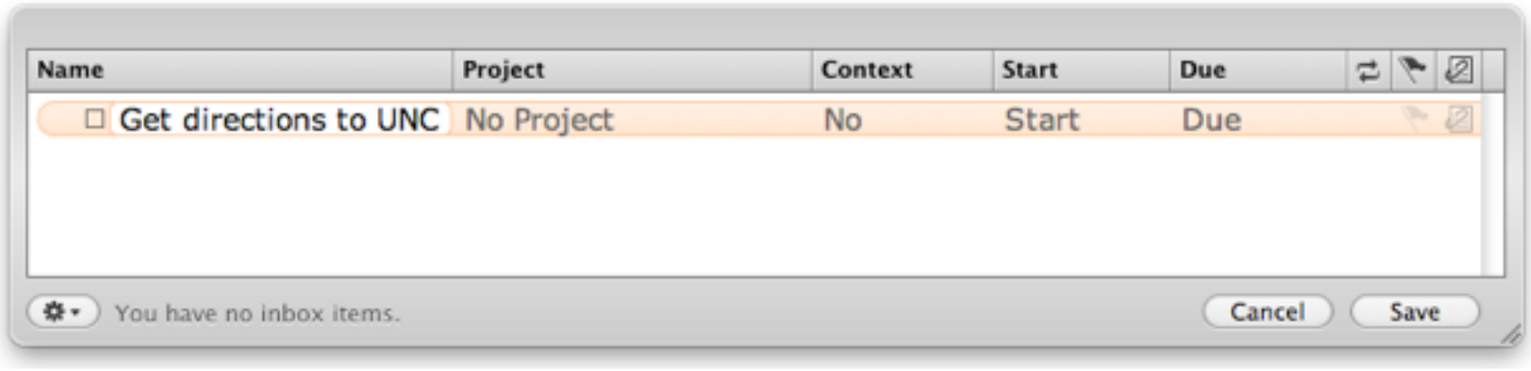
Which desktop do you want to face all day long?

2. Reduce # of workflows

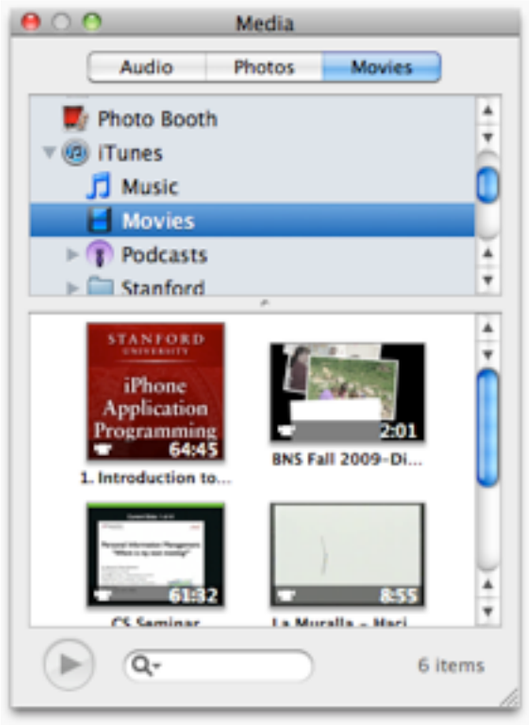
- Inbox, Mark (somehow), Work on it or Postpone it, and then file/archive (make it go away
- Files? "Downloaded Files" folder but we also have "Desktop" and we also have "/User/Manuel" and "~/Documents"... which one of these is where things go?

3. Enable quick-n-go actions

- Quick capture UIs



- Small-media browsers in other apps



- More "tasks" on the go would reduce switch to other contexts

4. Filter by context

- Voida's work is on track but not far reaching enough

- Ben Hanrahan's hypothesis: meta-contextual tools can become a black hole by allowing unintended distractions to prompt context switch

a) Meta-contextual are tools that support multiple work contexts as one (email, calendar, file manager, etc.)

Conclusions

- PIM should be considered in a dual-task scenario
- There is strong theoretical foundations in attention that matches well with PIM activities
- There is design practices that support the idea that managing attention is a problem
- We might be able to measure workload in PIM activities in multiple ways
- Future will tell if we can address the EBH problem

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Any Questions?

Thanks!

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