Dan’s Defense

* Items to explain more concisely and clearly
  + Peripheral’s digital logic needs higher voltage for communications to be able to accept incoming data fast enough – Explained in chapter 1 better than I did in person
  + Need to explain differences between IODVS and DVS, DVFS, DPM better. – Explained in Ch2.
    - Operation timing independent of voltage. –Ch1
    - DVFS – slowing down blocking operations to save energy while possible.
    - Would have been nice to have called it input/output DVS, rather than intra-operation DVS. Maybe device DVS? – I love naming things. I would like for it to have been input/output in order to be consistent with the general nomenclature. However, you could conceivably perform IODVS within an entirely self-contained chip. An onboard FLASH write/erase operation could use IODVS if an external + separate power supply were used. The only consistent requirement across all potential implementations is that there be a voltage-independent operation wherein we can modulate voltage to decrease power consumption.
  + NVM write completion is detected by polling status bit. No correctness problem for misprediction. – Only applies to SDCards in this implementation. Described in Ch3 and Ch5.
    - Code additionally verifies writes to NVM by reading back and confirming. Typical for high-integrity applications. << Clarify in dissertation >> – Clarified in Ch3.
    - Could use interrupt signal, available on some devices – Added to conclusions section of Ch5.
  + Relationship to other work
    - Didn’t go into related work enough, should have identified how this relates – Ch2.
    - Should have cited own work.
  + Quantify overall benefits/savings – how much less expensive can remote sensor module be? Size, weight of hold-up capacitor? Are you optimizing a small piece of the pie? – Added to conclusions
* Things to investigate, or at least identify in future work section – Added section 6.4
  + Investigating the predictor
    - Implications of prediction
      * Characterization: Know how long to wait until raising voltage rail, so can save power and energy
      * Can’t talk to device since voltages are mismatched, so measure current (or time) instead
      * Saving time in task – performance improvement
    - Implications of misprediction
      * Don’t do anything wrong, just power up earlier than necessary. Penalty is having to wait longer at higher voltage, check status flag again
      * Still will verify data for these apps
    - What is the best mispredict rate?
      * Depends on penalty for misprediction
      * How much slack is left on table?
    - Create cost model of operation given non-zero misprediction rate
  + What’s going on with SwissBit? Interesting – outlier, or typical of future devices? – Added to 5.4.4.3
  + Could have adaptive PACER based on misprediction rate
  + Investigation of temperature dependence
* Presentation
  + Slides too small
  + No introduction of acronyms or graphs.
  + Should have explained polling bit better. Identify what matters, explain it. Begin with end. Just talk about what matters.
* Dissertation feedback – from Vincent only if needed
* Eric – 3 points: clearly state use of status bit for detecting completion, discuss/model impact of misprediction, discuss differences between IODVS vs DVFS
* Other interesting points
  + I2C Comm: just need higher voltage for Slave->Master comm, not the other way – Explained in Ch3