**Motivation**

Imagine searching for a new laptop:
- Takes a lot of time to research
  - Review sites (CNET, TechCrunch, etc.)
  - Read Amazon freetext reviews
  - Product comparison tables/top 10 lists
- Difficult to understand technical terms
  - RAM, CPU, GPU
- Don’t know how product specifications meet your actual use needs such as gaming, student, business, media viewing, etc.

**Need a system to recommend products based on why you need them – by end use!**

**Results**

- Qualitative: slider preferences rank laptops that make sense for their respective categories
- Apple products consistently rank highly – attribute to overall more positive reviews and inflated sentiment scores
- Sentiment scores relative for laptops in same price category – people write reviews with a mindset influenced by other products in same category

**System Architecture**

Future Work

- Promising new search/recommendation paradigm
- NLP good start for seed info
- Human computation will ultimately keep system accurate and make up for algorithm accuracies

**Conclusion**

- Drill down for user preferences (add weight sliders for product technical specifications like screen size, CPU, brand, etc.)
- Human computation (structured user input) – utilize structured reviews to train algorithms where sentiment data is lacking
- Apply to different product categories

**Solution**

- Review text from Amazon, CNET, BestBuy, Newegg
- Semantic parsing with Stanford Parser
- Implemented state of art papers for sentiment analysis
- Novel algorithms for sentence classification
- Ranking score from weighted user input (sliders) with end use sentiment scores as well as regression over technical specifications

**Abstract**

This year, over 300 million individuals around the globe are purchasing a laptop. Of these individuals, over 58% will seek significant help from online sites, each spending an average of three weeks performing research prior to making a purchase. The majority of these individuals spend such a long time trying to find the right laptop because they struggle to understand how technical specifications, such as “RAM”, “processor speed” and “hard drive speed” relate to laptop uses, such as “gaming”, “listening to music”, and “watching HD movies.”

Sperch (www.sperch.com) is an intelligent laptop recommendation engine designed to reduce the amount of time consumers spend looking for laptops from three weeks to a matter of minutes. First, Sperch continuously scans the internet, collecting the latest laptop review information from blogs, review websites, tweets and laptop distributors. Second, using the latest algorithms from the field of natural language processing, Sperch analyzes these reviews to learn the strengths and weaknesses of laptops on the market, and to learn relationships between technical specifications and laptop uses. Finally, Sperch has an intuitive, easy-to-use interface wherein consumers indicate how they plan to use a laptop and Sperch delivers a ranked list of laptop recommendations from which users can conveniently choose.

**Authors**

Markus Beissinger (CIS)
Krishna Kaliannan (ESE)
Varant Zanoyan (CIS)

**Advisors**

Dr. Mitch Marcus
Dr. Robert Stine

Senior Project Poster Day 2013
Department of Computer Science
University of Pennsylvania

**SPERCH**

A Novel Product Recommendation Engine