SENIOR RESEARCH: SOME FINAL THOUGHTS

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How to read a research article

- What is the research problem, motivation, significance?
- What are the main findings?
- How do the authors try to convince you that these findings are valid? Experiments? Observational studies? Proofs?
- How does this work fit in the broader discipline?
- How can the work be followed up on?
- What are limitations of the work?

Writing a research paper, proposal, etc.

- Write with specificity and clarity
    - Background
    - Significance
    - Objective (may be specifically stated)
    - Results
    - Discussion
    - Etc
- Follow instructions and do not make any spelling or grammatical mistakes!

What did you guys learn?

- Artificial Intelligence / Machine Learning

  - *A Weather Image Recognition System*

  - *Twitter Bot Detection and Classification*

  - *Artificial Neural Network Comparison*

  - *Artificial Intelligence and Autonomous Vehicles, A Survey to of Computer Science student's views on Moral Dilemmas*

- Text Mining and Sentiment Analysis

  - *Does sentiment analysis mined from Tweets correlate to market fluctuations with Bitcoin*

  - *Text Mining to Summarize the Biomedical Literature*

  - *Sentiment analysis and popularity of Reddit posts*

What did you guys learn (continued)?

- ## Language / Method comparisons
  - *Comparison of Quicksort and Insertion sort*
  - *Analysis and Comparison of C++ and Python*
  - *Java Virtual Machine-based language comparison*

- ## Gamification
  - *Using Gamification to develop games for learning Computer Science topics*

- ## Cybsersecurity method evaluation
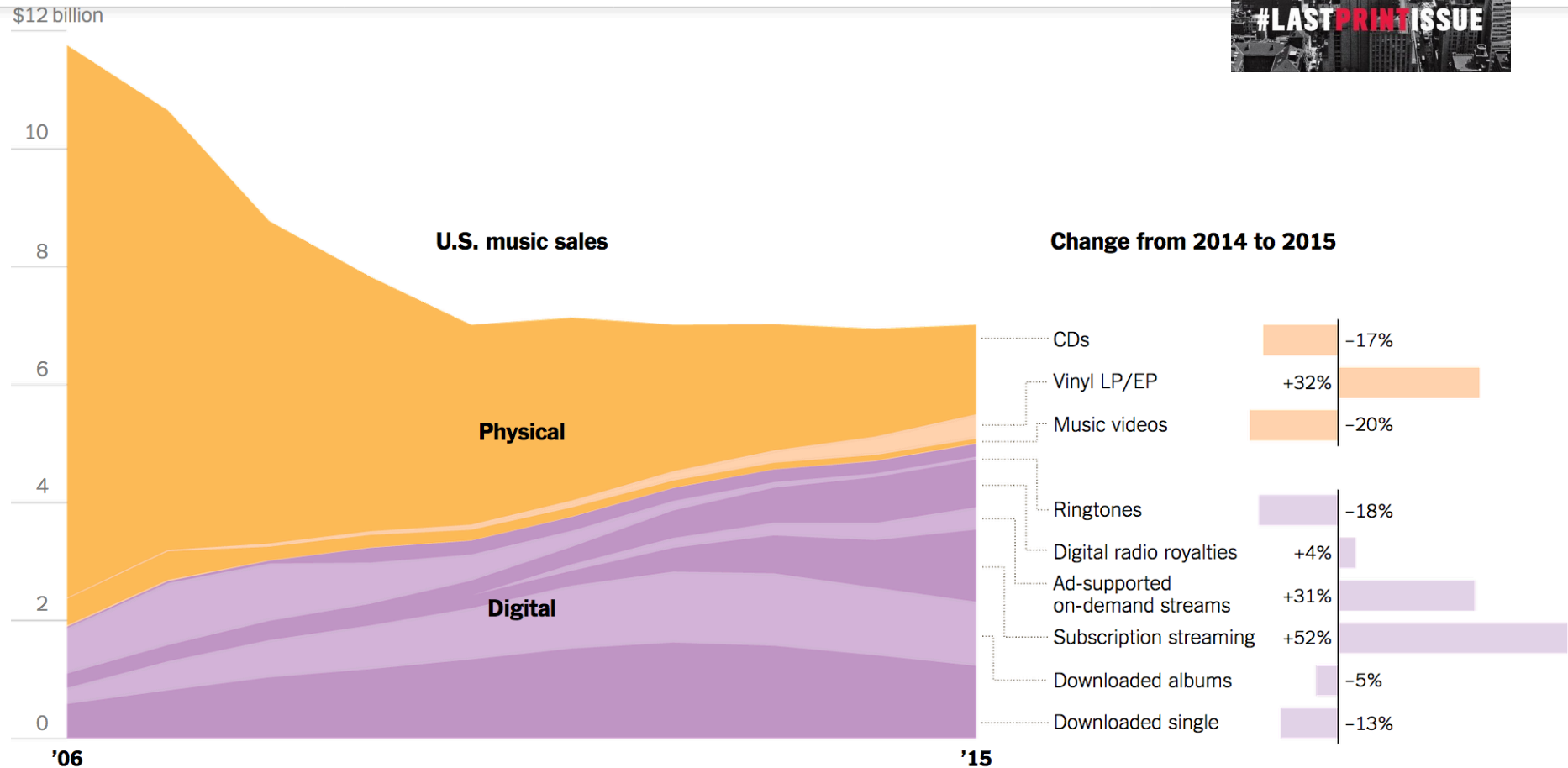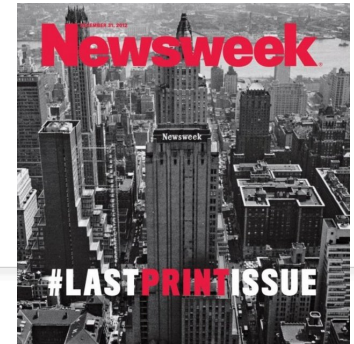 - *Preventing SQL Injection in R with SQL Interpolate*

CS and the Future: Random Thoughts

- How will facial recognition technology and self-driving cars impact our society?
  - http://www.npr.org/sections/alltechconsidered/2013/07/21/203273764/high-end-stores-use-facial-recognition-tools-to-spot-vips
  - http://www.citylab.com/tech/2012/03/what-intersections-would-look-world-driverless-cars/1377/

- The future of fake news?
  - http://futureoffakenews.com/

CS and the Future: Random Thoughts

- What digital privacy rights do we have?
  - Do we have the "right to be forgotten?"
    - http://www.theguardian.com/technology/2015/feb/19/google-acknowledges-some-people-want-right-to-be-forgotten

- Supreme Court cases:
  - Cell phone searches require a warrant (Riley vs. California)
    - http://www.cnn.com/2014/06/25/justice/supreme-court-cell-phones/
  - GPS tracking requires a warrant (U.S. vs. Jones)
    - http://www.washingtonpost.com/politics/supreme-court-warrants-needed-in-gps-tracking/2012/01/23/gIQAx7qGLQ_story.html
  - Does the government need a warrant to access cell phone location information (Carpenter v. U.S.) (will be decided this term)
    - https://www.npr.org/2017/11/29/567348000/justices-may-impose-new-limits-on-government-access-to-cellphone-data

Information wants to be free

U.S. music sales — Physical — Digital, $0 to $12 billion, from '06 to '15

Change from 2014 to 2015:
- CDs −17%
- Vinyl LP/EP +32%
- Music videos −20%
- Ringtones −18%
- Digital radio royalties +4%
- Ad-supported on-demand streams +31%
- Subscription streaming +52%
- Downloaded albums −5%
- Downloaded single −13%

The end of code?

In traditional programming, an engineer writes explicit, step-by-step instructions for the computer to follow.

With machine learning, programmers don't encode computers with instructions. They *train* them.

If you want to teach a neural network to recognize a cat, for instance, you don't tell it to look for whiskers, ears, fur, and eyes. You simply show it thousands and thousands of photos of cats, and eventually it works things out.

If it keeps misclassifying foxes as cats, you don't rewrite the code. You just keep coaching it.

Above excerpt from: https://www.wired.com/2016/05/the-end-of-code/