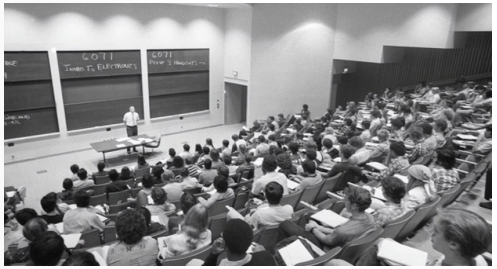
Increasing student engagement in massive open online courses

Hadi Ebrahimnejad

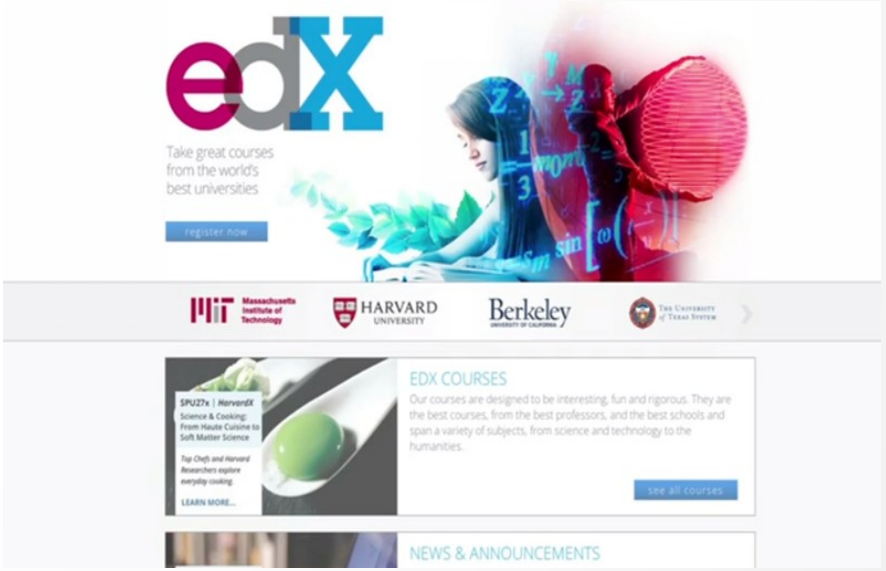
Use of technology in education

In spite of tremendous technological advancements, education hasn't really changed for centuries.

MIT (1960)



MIT (2010)



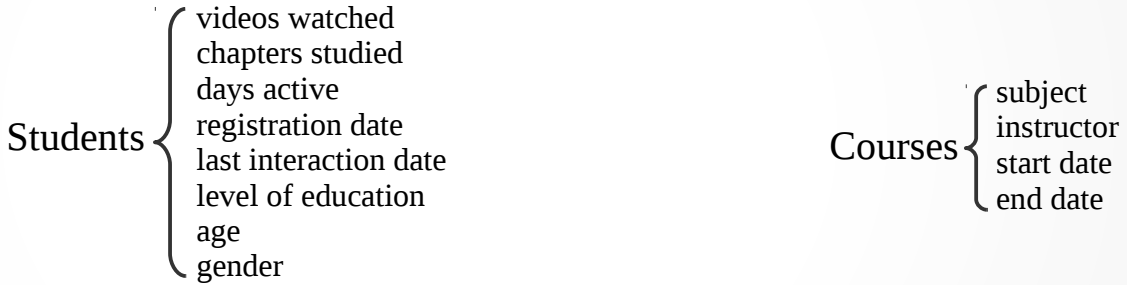
Massive open online courses (MOOC)

Online technologies can transform education in both scale and access.

- 155000 registrants: bigger than total MIT alumni
- 7157 certified: 40 years of traditional lecture time

Massive open online courses (MOOC)

Data is aggregated from a series of 17 online courses offered in 2012-2013 by Harvard & MIT on *edX* (445000 active registrants).



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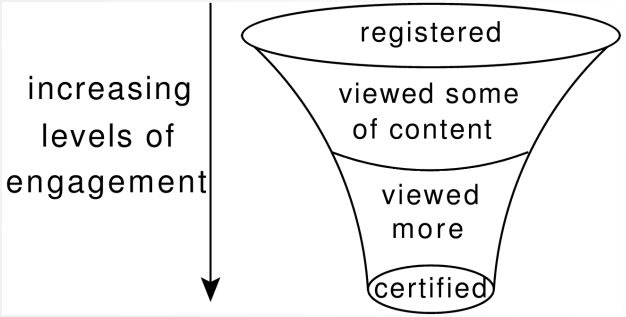

Students
- videos watched
- chapters studied
- days active
- registration date
- last interaction date
- level of education
- age
- gender

Courses
- subject
- instructor
- start date
- end date

Certification vs enrollment date

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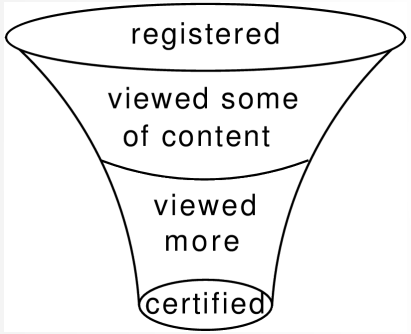

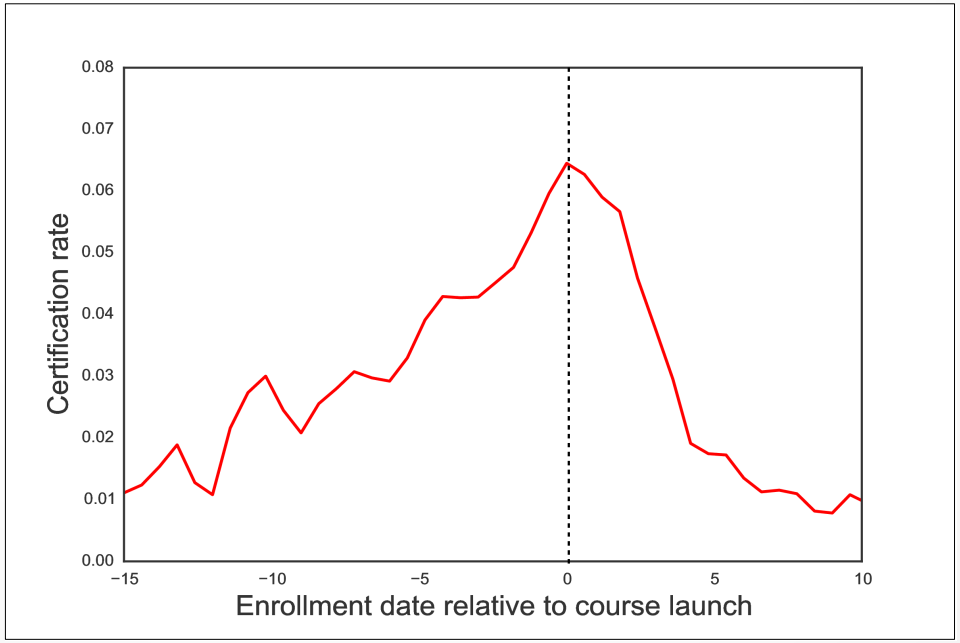

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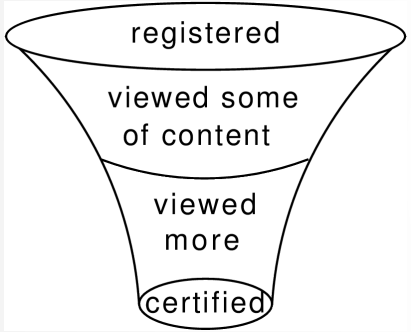

Can we construct a churn predictor for student certification?

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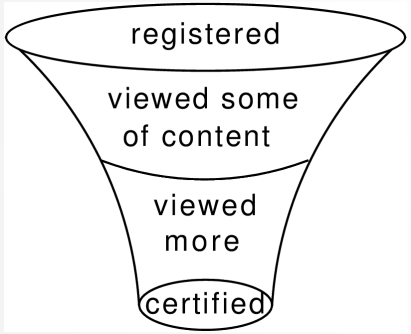

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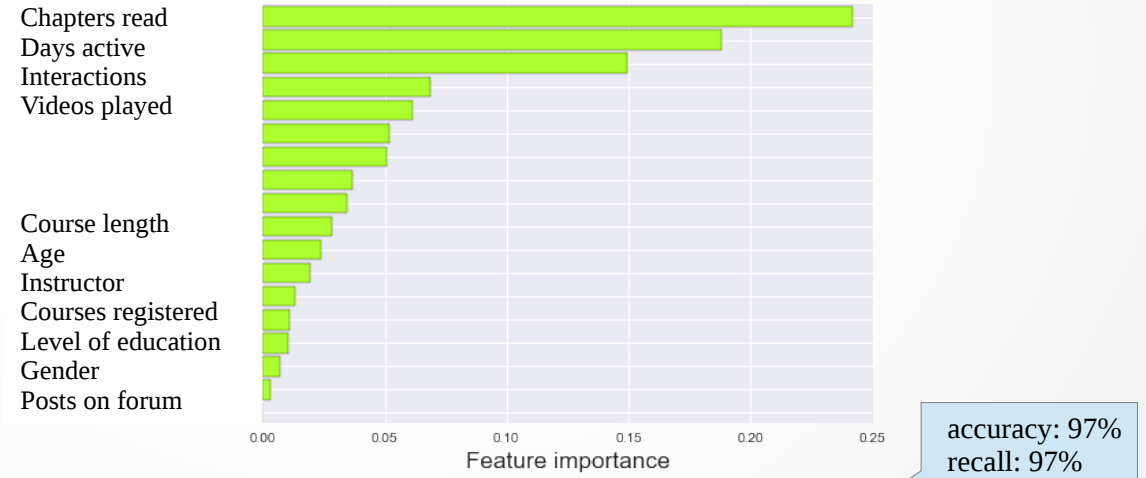

accuracy: 97%
recall: 97%
precision: 99%

RF classification of a balanced population

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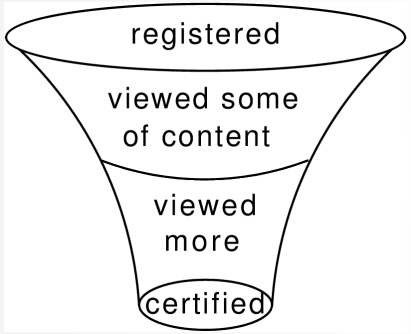

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Interactions
Videos played

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Level of education
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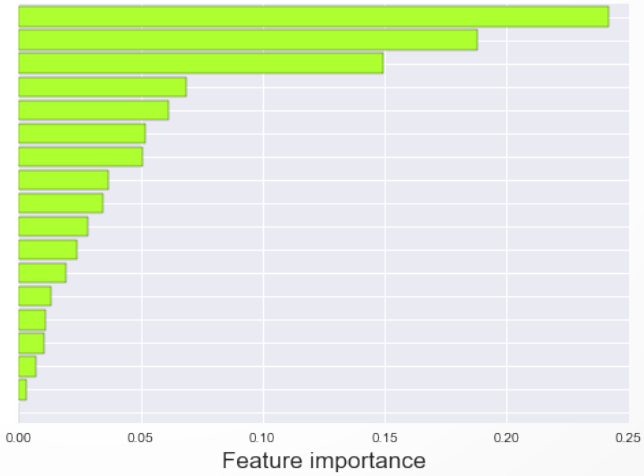

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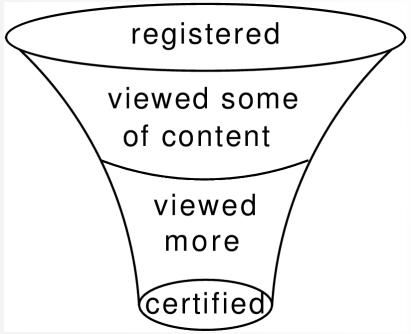

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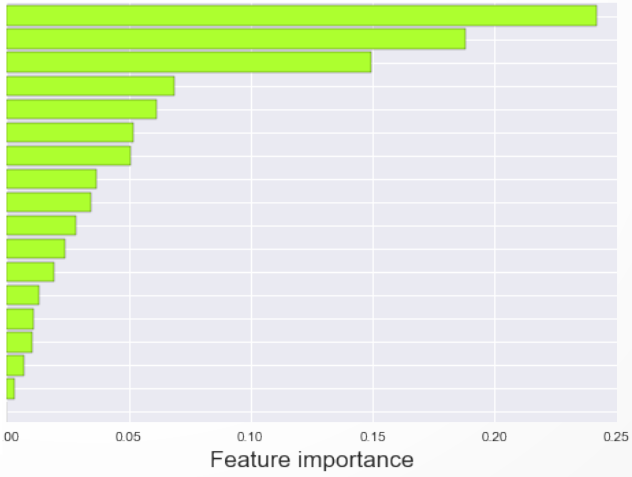

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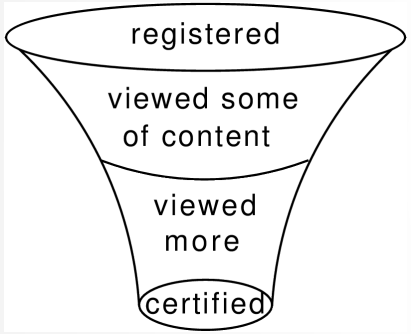
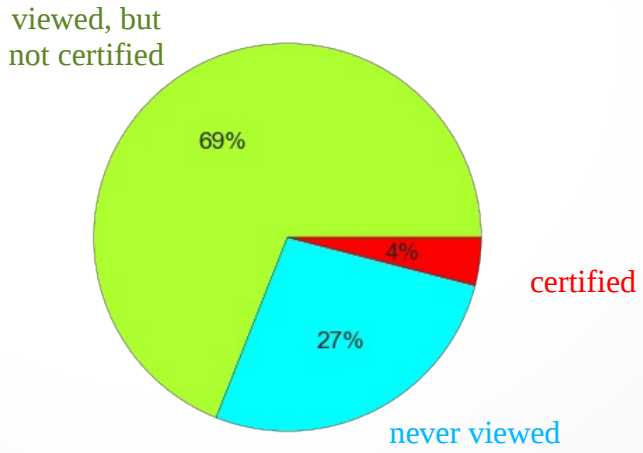
Focus on 'course view' instead of 'certification'

Certification rate is not a good measure of course effectiveness in MOOC:

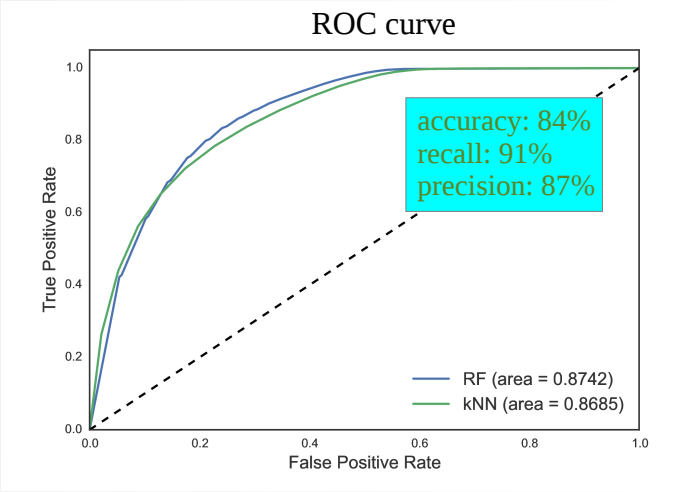
- most students don't attend online courses to get certificates.

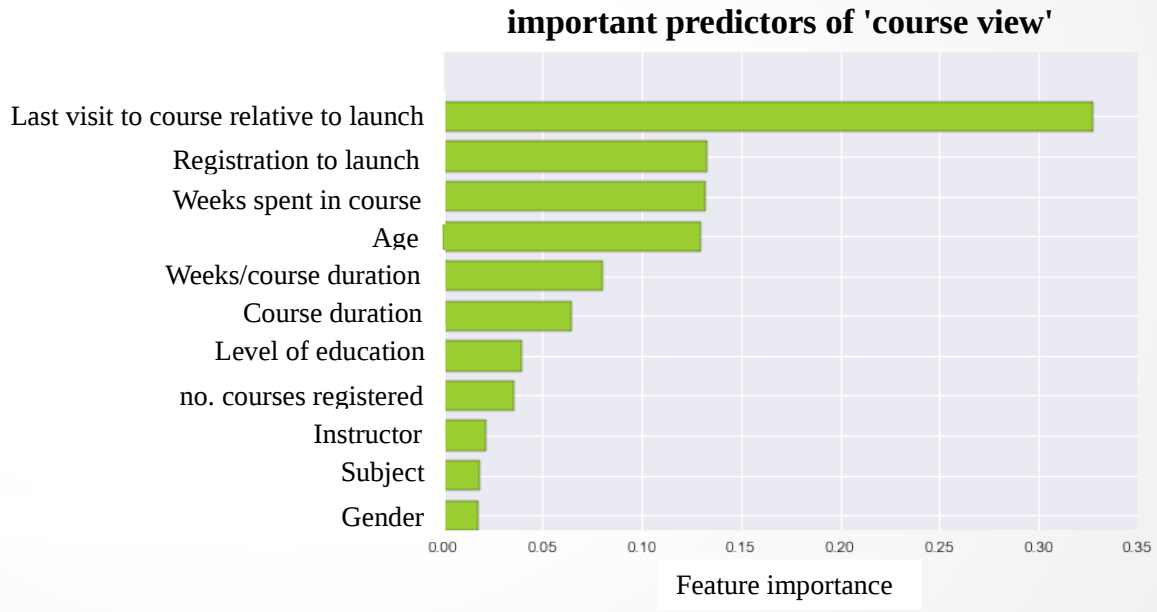




73% viewed
vs
4% certified

Predicting 'course view'





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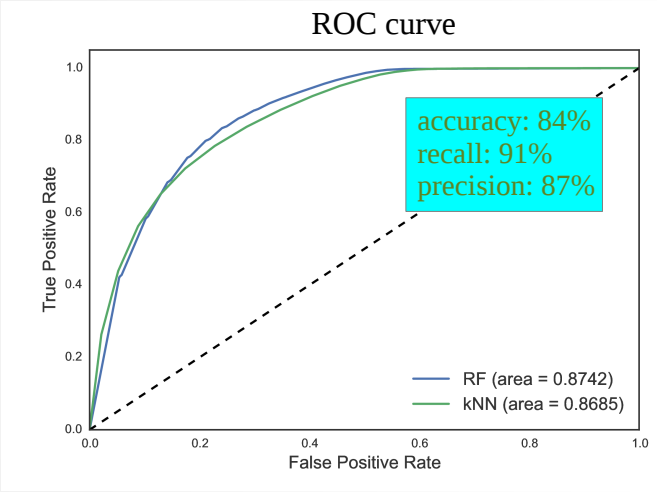

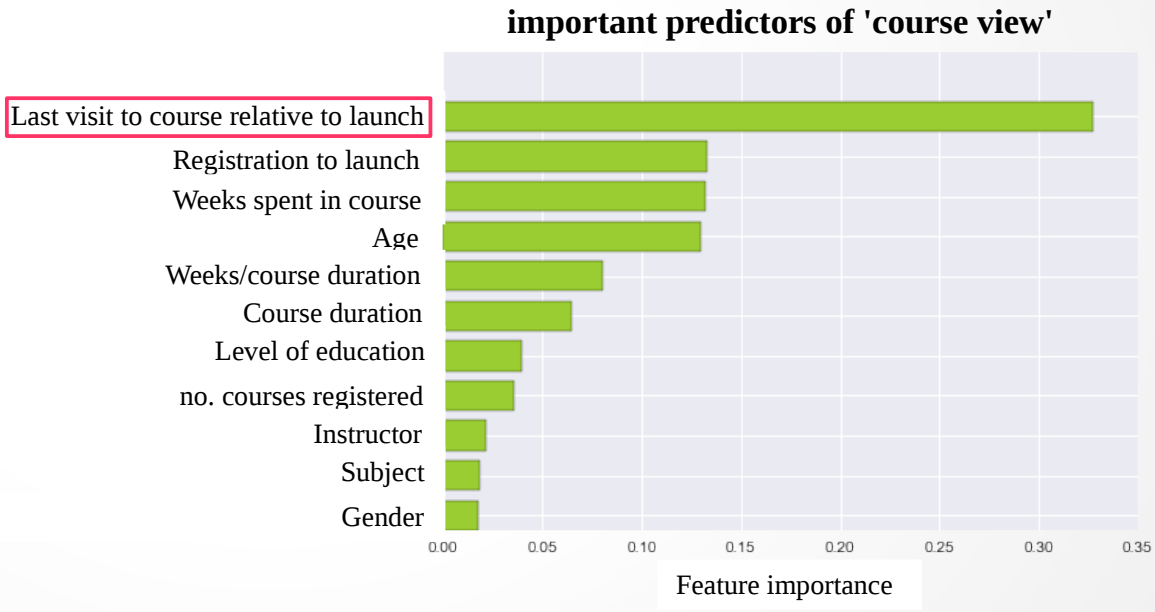

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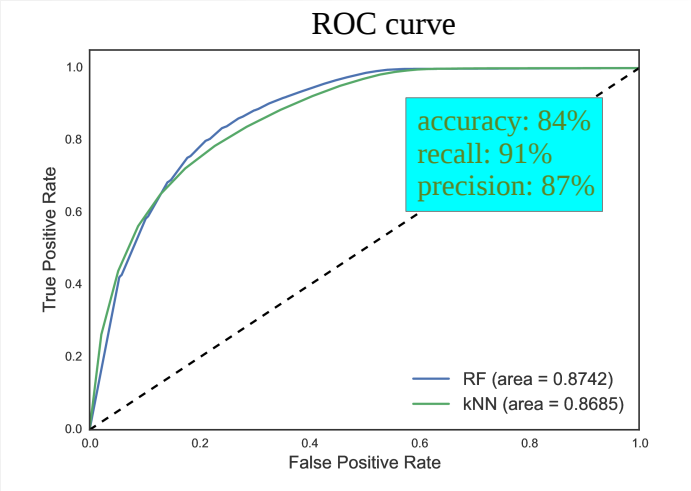

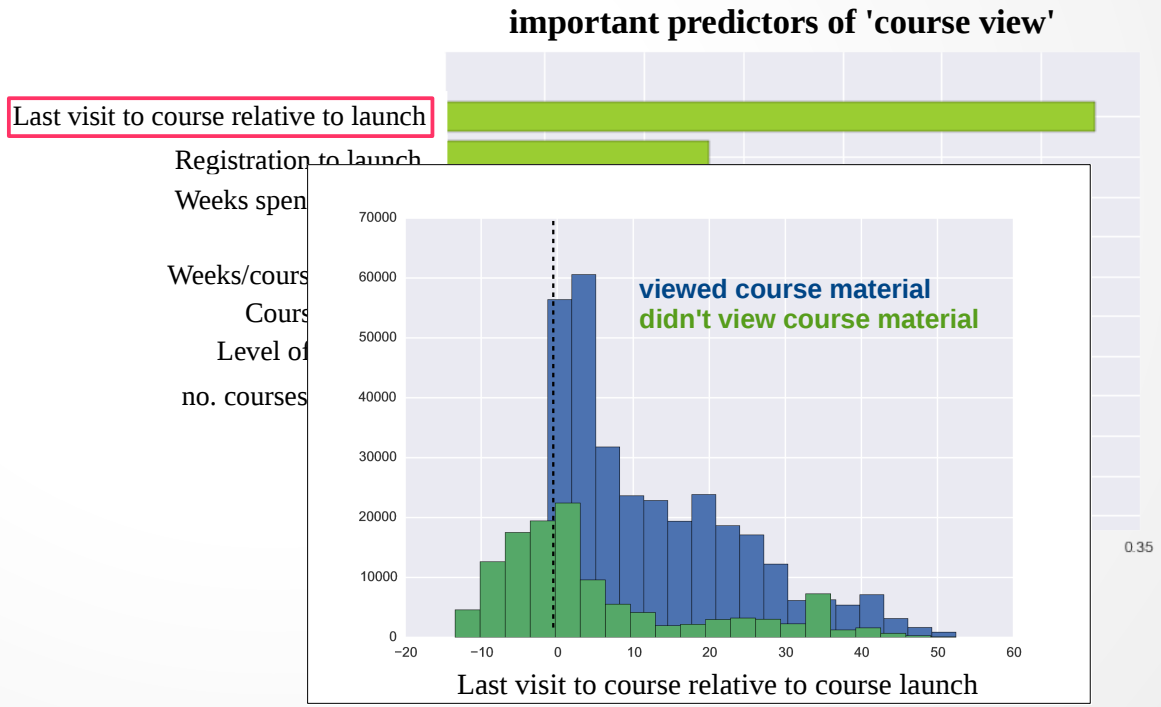

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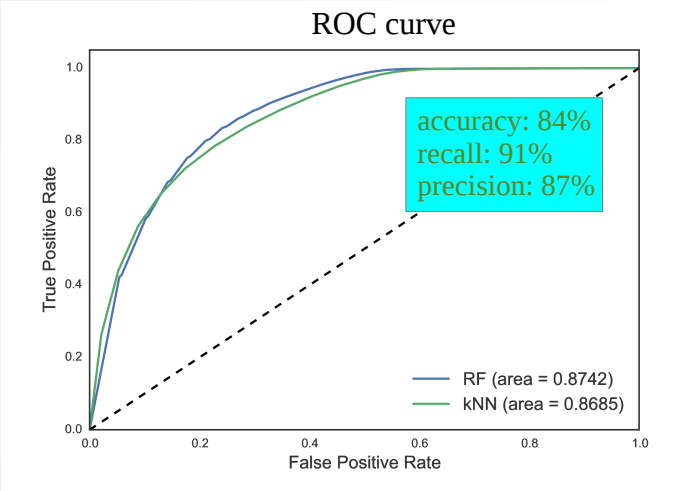
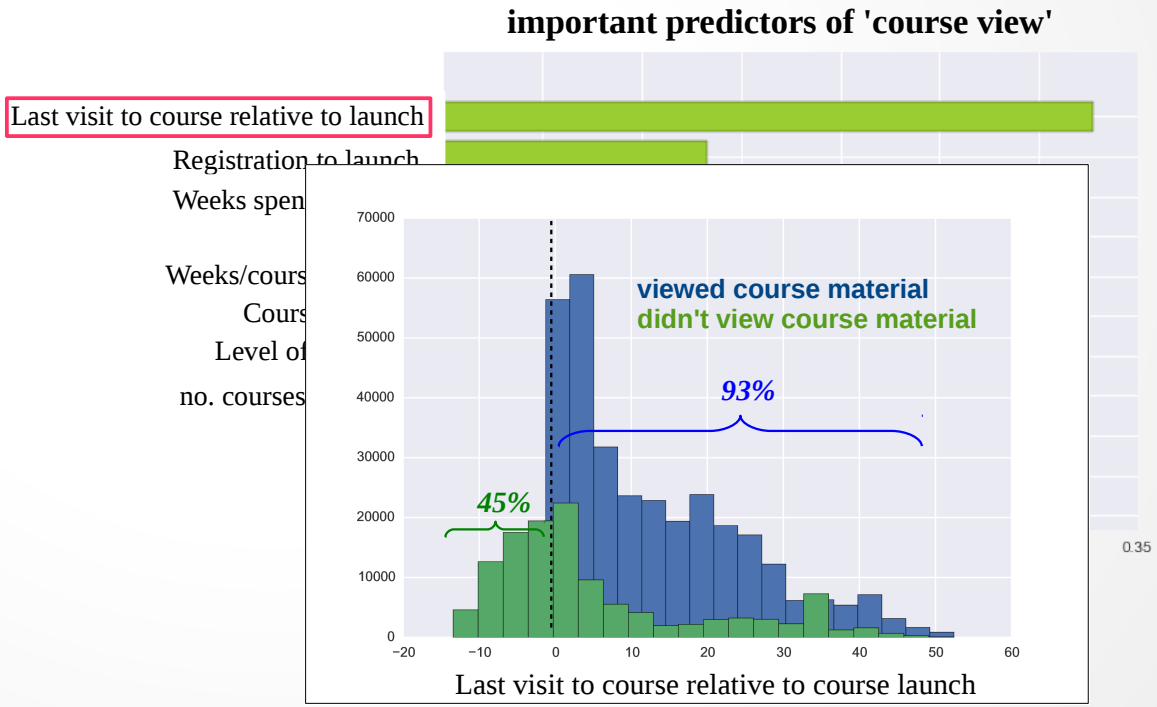
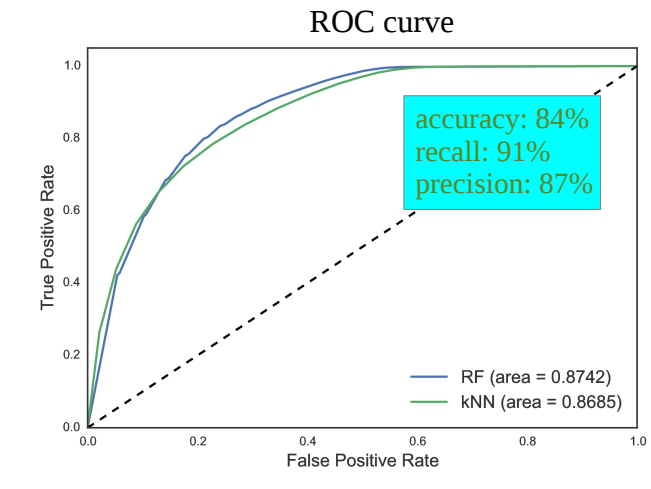
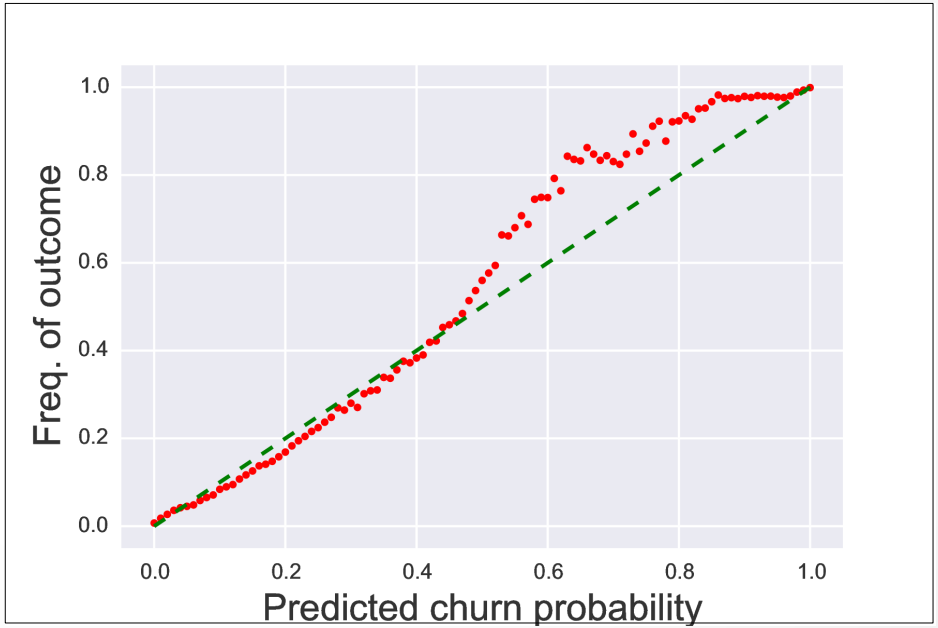


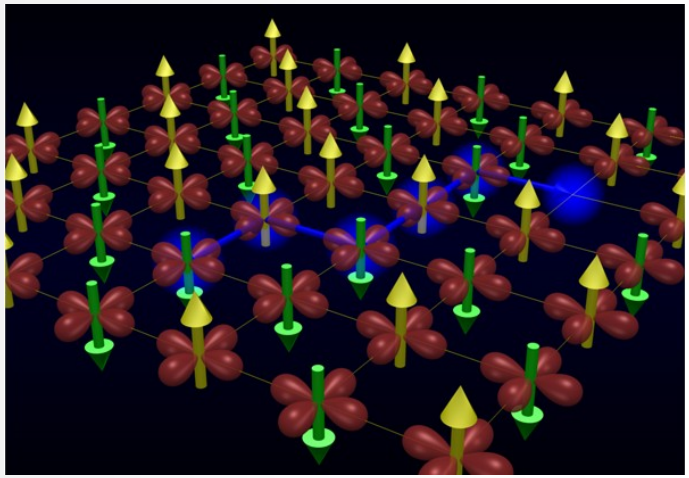


Thinking in terms of probabilities





Holes in magnetic materials



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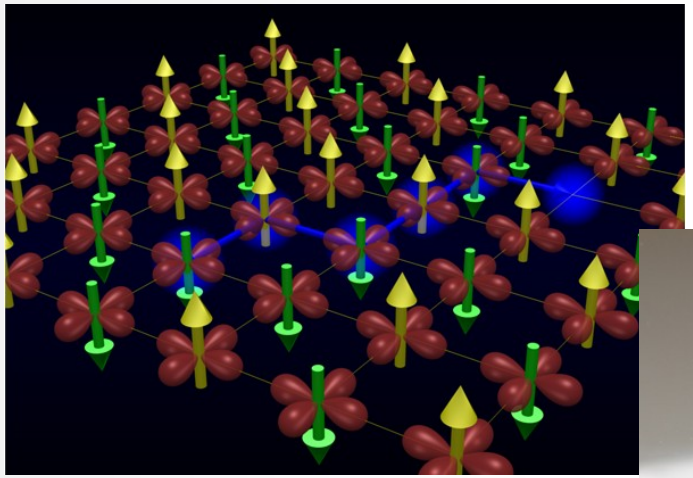
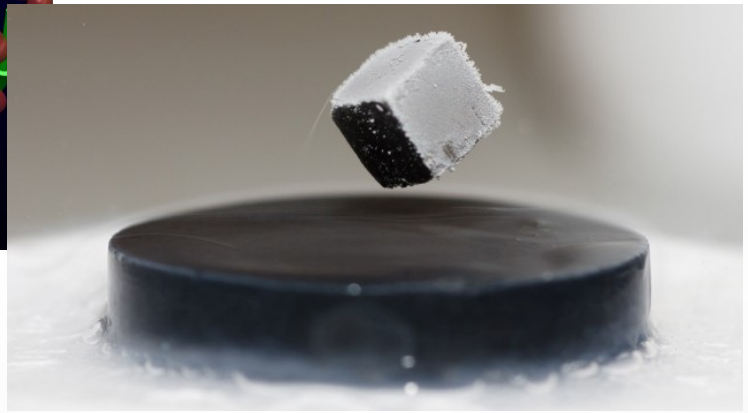


High-temperature superconductors



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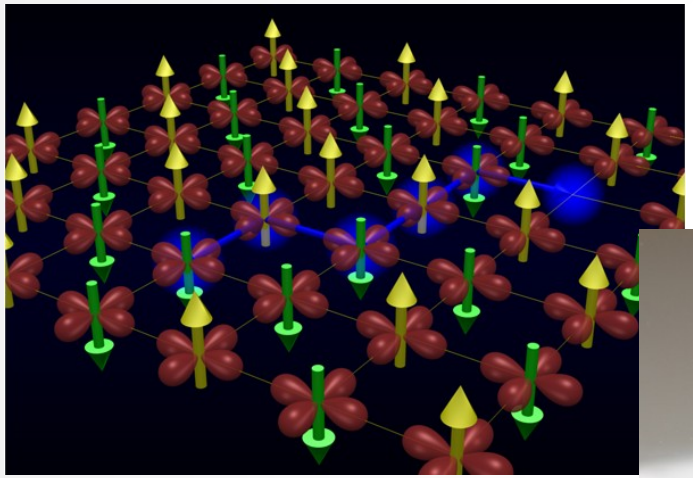

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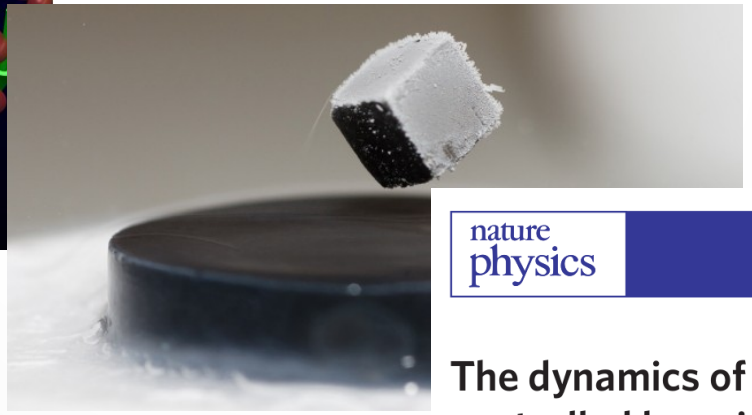

nature physics

ARTICLES

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The dynamics of a doped hole in a cuprate is not controlled by spin fluctuations

Hadi Ebrahimnejad[1], George A. Sawatzky[1,2] and Mona Berciu[1,2]*

Understanding what controls the dynamics of the quasiparticle that results when a hole is doped into an antiferromagnetically ordered CuO_2 layer is the first necessary step in the quest for a theory of the high-temperature superconductivity in cuprates.