Adaptive Information Filtering
from theory to practice

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Adaptive Information Filtering

the basics

a simply complex and dynamic problem
Adaptive Information Filtering

the basics

a simply complex and dynamic problem
Vector Space Model
and its dominance on computational models

- curse of dimensionality
- fixed dimensions
- centralized data structure
- parametric learning
- linear functions
NOOTROPIA
an immune-inspired interest profile

A network of thousand of features (antibodies) represents a user’s (or a group’s) multiple interests and continuously adapts to their changes.
Nootropia
a fundamental profiling model

- non-linear
- dimensionality resistant
- fast
- self-organizing
- distributed
- scalable
- language agnostic
nootropia: representation
nootropia: activation

incoming document

activated terms
nootropia: evaluation
nootropia: adaptation

before

after
2003  Building and Applying a Concept Hierarchy Representation of a User Profile
2004  Beyond TREC’s Filtering Track
2004  Multi-Topic Information Filtering with a Single User Profile
2009  What happened to Content-Based Information Filtering?
2009  Autopoiesis, the Immune System and Adaptive Information Filtering
2010  Revisiting Evolutionary Information Filtering
2010  Words, Antibodies and their Interactions
2010  A Network-Based Model for High-Dimensional Information Filtering
2011  Autonomous Learning in an Information Stream through Autopoiesis
2011  Content-Based Popularity Prediction of Digg Stories
from NOOTROPIA to NOOWIT
the first efforts
from NOOTROPIA to NOOWIT
unique algorithms coupled with innovative engineering and design

engineering
- profile optimization
- decentralization
- scheduling
- network optimization

cutting edge technologies
- python/tornado/Celery
- Reddis
- web workers
- Coffeescript/Jquery
- (Angular JS)

design
- paginated content
- two-dimensional ranking
- responsive design
- homogeneous UX

information architecture
- flat tagging
- sectioning
- networking effects
NOOWIT
A platform for creating and reading intelligent magazines that adapt to the interests of each individual reader

Personalized Content Aggregator
Aggregates articles from your favorite sources (publications, blogs, sites, users) into a stream filtered and presented as a magazine edited to match your interests.

Your own curated or originally authored magazine
Bookmark articles you wish to read later, or write and publish your own articles.

The most popular content in the magazine ecosystem
We use content-based popularity prediction to estimate the popularity of each article on the fly.
A platform for creating and reading intelligent magazines that adapt to the interests of each individual reader.

**Magazine Cover**

**Magazine Sections**

**Table of Contents**

**Adaptive Pages**

Every page is unique. Our technology makes sure that the more relevant an article is, the more space it occupies and vice versa.
Android ROMs, the easy way: Testing the new CyanogenMod Installer
Technology | ars technica | 10 hours ago

Don’t Get Defensive: Communication Tips for the Vigilant
Business | Harvard Business Review | 2 days ago

shaken, not stirred
Draper | STYLEPARK | 10 hours ago
CONTENT SUMMARIES (section cover)

New LinkedIn Showcase Pages Reach Just the Right Users
Mashable | 1 hour ago | page 04

ALL

Spotify vs. Bandcamp: Which Is More Band-Friendly?
Mashable | 1 hour ago | page 02

FiftyThree’s New Pencil Stylus and Paper App Are a Perfect Match
Mashable | 1 hour ago | page 04

Former Google Wallet Execs Raise $7 Million to Personalize Offline Retail
Mashable | 1 hour ago | page 03

Lexus to Reveal Two New Models on Vine
Mashable | 1 hour ago | page 05

NEW ARTICLES

your feedback
Adaptive Pages two-dimensional ranking

The same content as it appears to...

the fascionista
Adaptive Pages two-dimensional ranking

The same content as it appears to...

do the DIY lady
Adaptive Pages two-dimensional ranking

The same content as it appears to...

the passionate cook
Within each page articles are ranked according to their relevance score and are placed so that each article occupies space proportional to its relevance score. Noowit readers are more likely to read, provide positive feedback to and share the recommended articles, and ignore the rest.

The numbers above show the rank of articles within the page and correspond to the X axis of the figure on the right.
Noowit vs Personalizers
Not just a real-time search engine.
The first real-time Adaptive Information Filter.

- **a single profile** represents a user’s (or a group’s) **multiple interests**
- experimentally certified increase in **filtering accuracy** of more than 50%
- **support for 9 languages** and easily expandable to many more
- **minimum user effort**: no need to define the topics of interest, they are inferred in great detail based on the user’s interaction (MAGit, LOVit SHARit) with articles
- **no centralized computational structure**: the distributed nature of the model ensures scalability and reduces service costs
- **continuous learning** makes sure that the profile remains accurate over time and maintains user interest and engagement
Lessons Learned

- applying applied science is difficult
- the user is the ultimate evaluator
- accuracy can be less important than UX
- explaining filtering is not straightforward
- million details
- traditions are hard to break
History & Future

- September 2011 (started development)
- May 2012 (first private beta)
- March 2013 (second private beta)
- July 2013 (public beta)
- Early 2014 (version 3 + iOS apps)
- the unknown.....
the team:

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