LIBRARY CHAT ANALYSIS: A NAVIGATION TOOL

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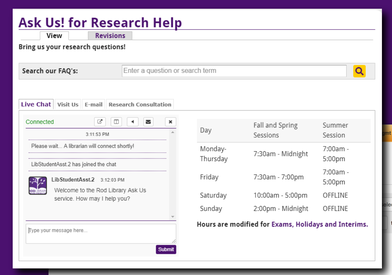
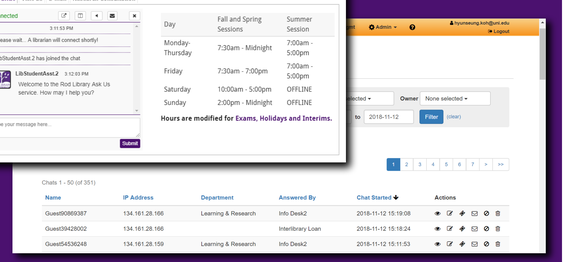
INTRODUCTION

- Chat features on academic libraries' websites have become an important communication channel that connects patrons to library resources, services, and spaces.
- Previously, researchers have made efforts to analyze chat data using different research methods and from different perspectives (Matteson, Salamon, & Brewster, 2011).
- Analysis and findings of chat transcripts could provide librarians with rich insights into improving the quality of their resources, services, and spaces.





DATA & ANALYSIS

- We analyzed 7000 chat transactions collected from April 10, 2015 to March 31, 2018 using our LibChat module in LibAnswers from Springshare.
- For topic extraction we utilized Latent Dirichlet Allocation (LDA), one natural language processing technique for topic extraction utilizing Python modules of numpy, scipy, gensim, and nltk. Also, we tuned allowable topic words versus stop words to improve the quality of chat-topics identified as an important step.

- Matteson, M., Salamon, J., & Brewster, L. (2011). A systematic review of research on live chat service. Reference & User Services Quarterly, 51(2), 82-100

TOPIC MODELING

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18 in [1] I need to download a book we are using in my class.  It&#x27;s
located on the EBSCOhost.  When I try to download it it asks me for my
username and password.  I tried my UNI password and name but that
didn&#x27;t work.  Do I need to sign up for an account? Are you on or off
campus? off campus In order to download  you may need to be on campus
using the universities wifi in order for it to know that you are a UNI
student. I live 3 hours away... What is the book? I can try and download
it for you. Guiding School Improvement with Action Research by Richard
Sagor I need to check a few places for the answer. I'll be back shortly...
Ok thanks. We may not have access to that database which would be why it
is not working. We have to ask one of our supervisors quick. We have
access to the database but not necessarily all of the articles. I can try
and see if it is on Google Scholar but otherwise we don't have access to
it. I just figured out how to save some of the pages.  I can only save 100
pages but I think that&#x27;s all I need for now.  It would be good to
know how to get the whole thing though. I am not finding it on Google
Scholar  so what you can do is try to request it on interlibrary loan
through the library or we can give your information to the supervisors in
the morning and they can see if they can find a way to download it. Oh
sorry.  I am working on an assignment and I forgot to check back for a few
minutes.  How do I request it on inter-library loan?  I can wait until
tomorrow too. No worries! There is a link on the library's homepage that
you can go to! I will also ticket this chat so a supervisor or librarian
will look at it in the morning! Sounds good.  Thanks! You're welcome!
```

```
" + 0.014*"need" + 0.010*"room" +
)
ok" + 0.016*"need" + 0.015*"journal" +
om" + 0.013*"link" + 0.012*"looking" +
oor" + 0.028*"book" + 0.027*"desk" +
(4, '0.014*"computer" + 0.013*"know" + 0.012*"working" + 0.009*"room" +
0.008*"like" + 0.008*"much"')
(5, '0.011*"article" + 0.010*"could" + 0.007*"u" + 0.007*"one" +
0.007*"full" + 0.007*"need"')
(6, '0.029*"book" + 0.026*"loan" + 0.022*"interlibrary" + 0.020*"request"
+ 0.017*"article" + 0.015*"access"')
(7, '0.018*"article" + 0.011*"one" + 0.011*"book" + 0.010*"find" +
0.008*"online" + 0.007*"dissertation"')
(8, '0.032*"data" + 0.018*"fluency" + 0.013*"reading" + 0.013*"book" +
0.008*"observation" + 0.008*"language"')
(9, '0.020*"medium" + 0.018*"digital" + 0.017*"hub" + 0.011*"equipment" +
0.010*"open" + 0.009*"go"')
(10, '0.053*"article" + 0.030*"find" + 0.021*"search" + 0.020*"database" +
0.018*"topic" + 0.017*"research"')
(11, '0.015*"one" + 0.013*"looking" + 0.012*"need" + 0.011*"article" +
0.011*"student" + 0.009*"information"')
.015*"find" + 0.013*"link" +
source" + 0.010*"website" +
reserve" + 0.022*"room" +
"give" + 0.011*"advanced" +
"instrument" + 0.009*"ok" +
012*"print" + 0.012*"new" +
```

```
(6, '0.029*"book" + 0.026*"loan" + 0.022*"interlibrary" + 0.020*"request"
+ 0.017*"article" + 0.015*"access"')
topic words:['book', 'loan', 'interlibrary', 'request', 'article',
'access']
line #'s with 6 matches[18, 261, 886, 950]
line #'s with 5 matches[151, 171, 329, 347, 362, 450, 477, 673, 686, 819,
859, 877, 881, 917, 947, 953]
line #'s with 4 matches[3, 20, 82, 96, 167, 415, 430, 432, 437, 462, 466,
475, 546, 575, 653, 770, 783, 864, 866, 876, 929, 1012, 1020, 1088, 1117]
line #'s with 3 matches[129, 149, 158, 238, 268, 295, 343, 391, 400, 481,
482, 499, 507, 554, 596, 602, 616, 654, 672, 685, 700, 712, 713, 728, 738,
769, 789, 798, 805, 841, 879, 898, 940, 967, 1002, 1014, 1024, 1122]
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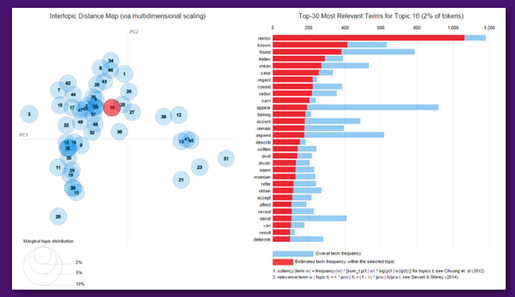
FINDINGS

- We found that some topics are more accurate than others in representing topics of each chat.
- A topic of "Interlibrary Loan" is one example that stands out very accurately and is easily identifiable on which chat is associated with this topic.
- Our tool allows librarians to easily identify a landscape of topics in their chat data, map each topic back to a small set of chat data for their further qualitative and deeper analysis, and take appropriate actions in a timely manner.



FUTURE DIRECTION

We continue to evolve our chat-analysis tool by improving its accuracy of topic extraction and its usability.

- Incorporation of multiple topic extraction techniques (e.g., non-negative matrix factorization) should help improve accuracy of topic extraction.
- Improvements to usability include application of visualization techniques for chat-analysis results, and the ability to accept chat-data from other commonly used chat programs (e.g., LibraryH3lp).

We believe that librarians at a broad range of institutions will take advantage of a user-friendly high-level chat-analysis tool developed by this study.