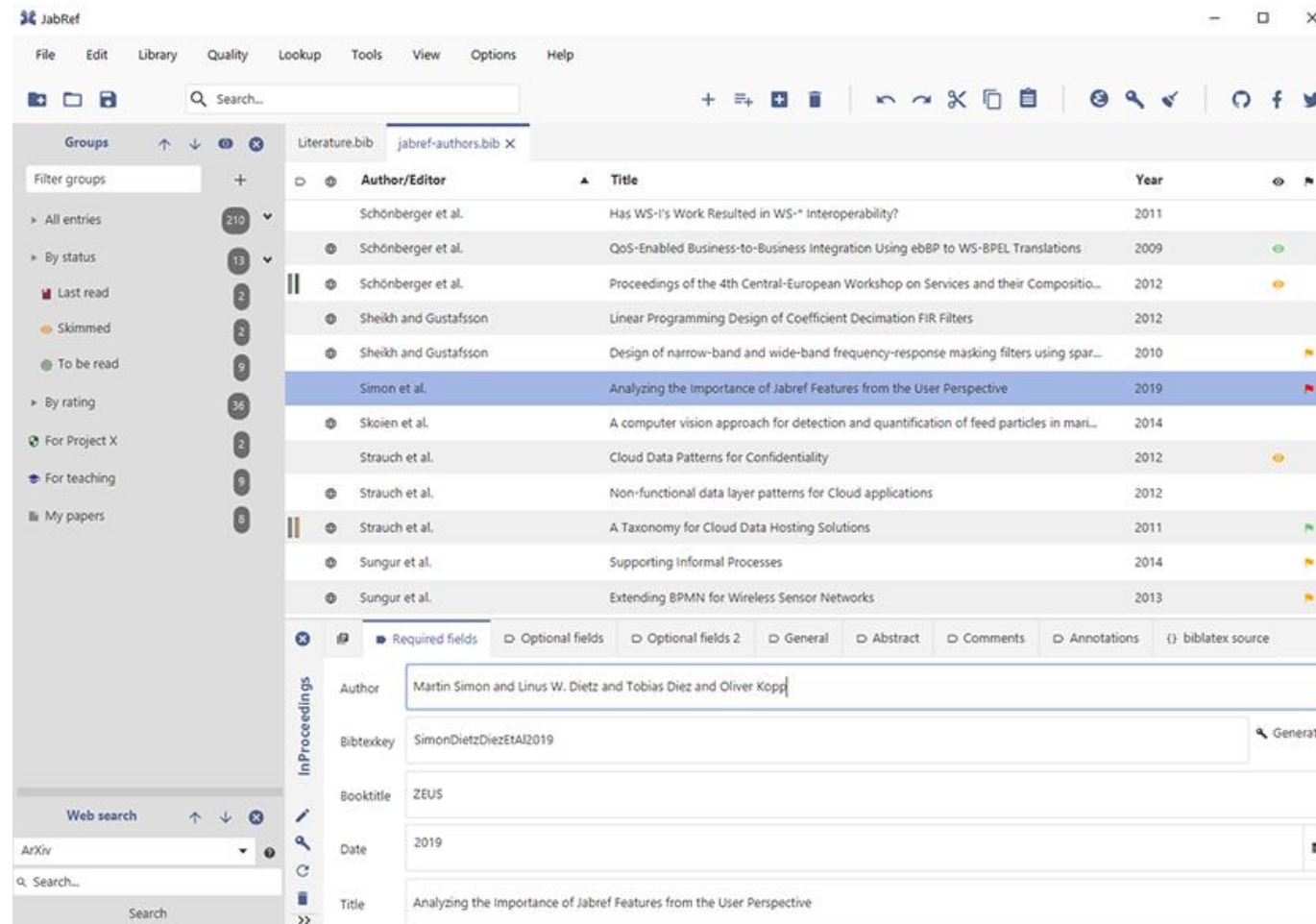# JabRef

CS304 SE Project Final Presentation

Team Name   OT Team

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Introduction to JabRef

- An open-source, cross-platform citation and reference management tool
  - helps collect and organize sources
  - find papers needed and discover the latest research

- Features
  - free of charge
  - actively developed

Introduction to JabRef

- **Collect**
  - ◆ search across many online scientific catalogues
  - ◆ import options for over 15 reference formats
  - ◆ extract metadata from PDFs
- **Organize**
  - ◆ hierarchical collections, keywords/tags
  - ◆ advanced search and filter features
  - ◆ keep track of what has been read
- **Cite**
  - ◆ native BibTeX and Biblatex support
  - ◆ many thousand built-in citation styles
  - ◆ support for Word and LibreOffice/OpenOffice
- **Share**
  - ◆ export format
  - ◆ share with others via Dropbox
  - ◆ sync the contents of a library via a SQL database

Timeline of the Project - Plan

Week	To Do
Week 1~11	Fix 7 issues and write JavaDoc and test cases for them. Try to use different tools taught in labs to test the project. Write a progress report and give the midterm presentation.
Week 12	Fix two issues and write JavaDoc and test cases for them.
Week 13	Fix two issues and write JavaDoc and test cases for them.
Week 14	Fix two issues, write JavaDoc and test cases for them, write final report and make final slices to prepare for the final presentation.

Follow the Timeline - Verion Histories

■ We have followed the timeline perfectly.
  ◆ fulfilled the tasks ahead of schedule every week
  ◆ fixed more issues than what we had planed before

| Week	Pull Requests

Before Week 10	**Fixed invisible file path in the dark theme** #7396
	`Merged` calixtus merged 2 commits into `JabRef:master` from `cs304-spring2021:fix-for-issue-7382` on 30 Jan
	Fix the issue "Endless exception dialogues with illegal char in file path" #7397
	`Closed` Fu188 wants to merge 8 commits into `JabRef:master` from `cs304-spring2021:fix-for-issue-7381`
	fix "Alt + keyboard shortcuts do not work" #7379
	`Merged` tobiasdiez merged 7 commits into `JabRef:master` from `cs304-spring2021:fix-for-issue-6994` on 1 Feb
	Readd query syntax validation #7418
	`Closed` Fu188 wants to merge 8 commits into `JabRef:master` from `Fu188:fix-for-issue-7411`
	Added a strong border on hover to the file field #7413
	`Closed` Fu188 wants to merge 2 commits into `JabRef:master` from `Fu188:fix-for-issue-6859`
	Fixed secondary sorting not working for some special fields #7409
	`Merged` calixtus merged 3 commits into `JabRef:master` from `Fu188:fix-for-issue-7015` on 2 Feb
	6 pull requests, 3 merged

Follow the Timeline - Verion Histories

- We have followed the timeline perfectly.
    - fulfilled the tasks ahead of schedule every week
    - fixed more issues than what we had planed before

Week	Pull Requests
Week 10	Fixes #7016 toggle of special fields does not work for sorted entries #7656 Merged Siedlerchr merged 2 commits into JabRef:main from JavuesZhang:fix-for-issue-7016 24 days ago Fix#7195 partly Opacity of disabled icon-buttons #7655 Merged Siedlerchr merged 2 commits into JabRef:main from JavuesZhang:main 28 days ago Fixes Jabref#7660 Unable to download some arXiv links if the "eprint" field is missing #7663 Merged Siedlerchr merged 1 commit into JabRef:main from JavuesZhang:fix-for-issue-7660 27 days ago Fix SSLHandshake Exception by using bypass #7657 Merged Siedlerchr merged 6 commits into JabRef:main from Ryyyc:fix-for-issue-7616 28 days ago **4 pull requests, 4 merged**
Week 11	Fixes Jabref#7305: the RFC fetcher is not compatible with the draftFix for issue 7305 #7674 Merged koppor merged 4 commits into JabRef:main from Ryyyc:fix-for-issue-7305 17 days ago **1 pull request, 1 merged**

Follow the Timeline - Verion Histories

- We have followed the timeline perfectly.
  - ◆ fulfilled the tasks ahead of schedule every week
  - ◆ fixed more issues than what we had planed before

| Week	Pull Requests
Week 12	Fix for issue 6877: Allow users to customize the API Key #7720 Open Ryyyc wants to merge 19 commits into JabRef:main from Ryyyc:fix-for-issue-6877 Select the entry which has smaller dictonary order when merge #7708 Merged koppor merged 6 commits into JabRef:main from SuXiChangZhen:fix-for-issue-7395 10 days ago 2 pull requests, 1 merged
Week 13	Fix for issue 5804: Rewrite ACM fetcher #7733 Merged koppor merged 15 commits into JabRef:main from Ryyyc:fix-for-issue-5804 4 hours ago support fall back fields in citation key generation #7734 Open SuXiChangZhen wants to merge 12 commits into JabRef:main from SuXiChangZhen:fix-for-issue-7111 2 pull requests, 1 merged
Week 14	Add referenced entry's observers to update the crossref entry's preview table #7754 Open SuXiChangZhen wants to merge 2 commits into JabRef:main from SuXiChangZhen:fix-for-issue-7730 1 pull request

Important Issues 1 (#7015)

- Issue #7015:
  - In the entry table, entries can be sorted by clicking on the column title (primary sorting). By holding the SHIFT key, a second sorting criteria can be used.
  - It works with a primary sorting and a secondary sorting on fields like "Year", "Title", "Author", etc.
  - But if the primary sorting is done on the special field "Relevancy", "Quality" or "Print status", the marked entries are not sorted based on the second sorting criteria. Only the entries that are not marked are sorted.

- Pull Request #7409:
  - Since compartors are not set for the special field is "Relevancy" or "Quality" or "Print status", it would not work for secondary sorting.
  - To deal with it, just add a file called "ToggleFieldComparator" to assist these three toggle special field as their comparators. And it works now.
  - Tests created for changes.
  - Manually tested changed features in running JabRef.

Important Issues 1 (#7015)

■ Example: Set "Relevancy" as the first criteria and "Year" as the second.
  ◆ Ascending order:

Entrytype	Author/Editor	Title	Year	Journal/Booktitle
InProceedings	Whitten and Tygar	Why Johnny can't encrypt: a us...	1999	SSYM'99: Proceedings of the 8t...
PhdThesis	deBraga	The postcranial anatomy of *Pro...*	2001	
Article	von Hippel et al.	Article with complex Authorna...	2004	IEEE Security and Privacy
Article	Bardram	The trouble with login: on usabi...	2005	Personal Ubiquitous Comput.
InProceedings	Boström et al.	Extending XP practices to supp...	2006	SESS '06: Proceedings of the 20...
InProceedings	Braz and Robert	Security and usability: the case ...	2006	IHM '06: Proceedings of the 18t...
InProceedings	Bruschi et al.	Introduction to software engine...	2006	SESS '06: Proceedings of the 20...
Article	Clear	Design and usability in security ...	2002	SIGCSE Bull.
InProceedings	Rozinov	Are Usability and Security Two ...	2004	
Article	Yan et al.	Password Memorability and Sec...	2004	IEEE Security and Privacy
Book	Cranor and Garfinkel	Security and Usability	2005	
InProceedings	de Paula et al.	Two experiences designing for ...	2005	SOUPS '05: Proceedings of the ...
InProceedings	DeWitt and Kuljis	Aligning usability and security: ...	2006	SOUPS '06: Proceedings of the ...
InProceedings	Naedele and Koch	Trust and tamper-proof softwar...	2006	SESS '06: Proceedings of the 20...
InProceedings	Nosseir et al.	Question-based authentication ...	2006	NordiCHI '06: Proceedings of th...
InProceedings	Win et al.	How secure is AOP and what ca...	2006	SESS '06: Proceedings of the 20...
InProceedings	Hinds and Ekwueme	Increasing security and usability...	2007	ACM-SE 45: Proceedings of the ...
InProceedings	Jakubowski and Venkatesan	Randomized radon transforms f...	2007	DRM '07: Proceedings of the 20...
Article	Churchill et al.	Useful Computer Security	2008	IEEE Internet Computing
InProceedings	Kostakos	Human-in-the-loop: rethinking ...	2008	CHI '08: CHI '08 extended abstr...

Important Issues 1 (#7015)

- Example: Set "Relevancy" as the first criteria and "Year" as the second.
  - Descending order:

	Entrytype	Author/Editor	Title	Year	Journal/Booktitle	
	InProceedings	Boström et al.	Extending XP practices to supp...	2006	SESS '06: Proceedings of the 20...	
	InProceedings	Braz and Robert	Security and usability: the case ...	2006	IHM '06: Proceedings of the 18t...	
	InProceedings	Bruschi et al.	Introduction to software engine...	2006	SESS '06: Proceedings of the 20...	
	Article	Bardram	The trouble with login: on usabi...	2005	Personal Ubiquitous Comput.	
	Article	von Hippel et al.	Article with complex Authorna...	2004	IEEE Security and Privacy	
	PhdThesis	deBraga	The postcranial anatomy of *Pro...*	2001		
	InProceedings	Whitten and Tygar	Why Johnny can't encrypt: a us...	1999	SSYM'99: Proceedings of the 8t...	
	Article	Churchill et al.	Useful Computer Security	2008	IEEE Internet Computing	
	InProceedings	Kostakos	Human-in-the-loop: rethinking ...	2008	CHI '08: CHI '08 extended abstr...	
	InProceedings	Hinds and Ekwueme	Increasing security and usability...	2007	ACM-SE 45: Proceedings of the ...	
	InProceedings	Jakubowski and Venkatesan	Randomized radon transforms f...	2007	DRM '07: Proceedings of the 20...	
	InProceedings	DeWitt and Kuljis	Aligning usability and security: ...	2006	SOUPS '06: Proceedings of the ...	
	InProceedings	Naedele and Koch	Trust and tamper-proof softwar...	2006	SESS '06: Proceedings of the 20...	
	InProceedings	Nosseir et al.	Question-based authentication ...	2006	NordiCHI '06: Proceedings of th...	
	InProceedings	Win et al.	How secure is AOP and what ca...	2006	SESS '06: Proceedings of the 20...	
	Book	Cranor and Garfinkel	Security and Usability	2005		
	InProceedings	de Paula et al.	Two experiences designing for ...	2005	SOUPS '05: Proceedings of the ...	
	InProceedings	Rozinov	Are Usability and Security Two ...	2004		
	Article	Yan et al.	Password Memorability and Sec...	2004	IEEE Security and Privacy	
	Article	Clear	Design and usability in security ...	2002	SIGCSE Bull.	

Important Issues 2 (#7111)

- Issue #7111:
  - To generate citation key, user can customize the pattern. For example, [author:(noa)]. The citation key will be the author's name if exists, otherwise it will be "noa".
  - If user wants to set *author* as citation key, when *author* does not exist, then use *year*, there was no pattern support it. User can solve it by using complicated regular expression.
  - Now it support this feature, the pattern should be: [author:([year])]

- Pull Request #7734:
  - It turns out the jabref cannot parse nested brackets, so first modify the code to support parsing nested bracket
  - the content inside parentheses was regarded as a constant string. Now it should be parsed again.
  - Different test cases are designed(unbalanced brackets, two fallback fields…)

Important Issues 2 (#7111)

The pattern is [author:([YEAR])], when the field [Author] is Null, use field [Year] as citation key

Important Issues 3 (#5804)

- Issue #5804:
  - Fetcher is a tool that JabRef obtains and parses entries from the Internet.
  - ACM fetcher is disabled because its API interface is outdated on 2 Jan 2020.

- Pull Request #7409:
  - Rewrite ACM fetcher.
  - Solution is to get the DOI from the HTML results of the search page, then use the export interface to get the JSON format data, and finally parse them.
  - Add sufficient test cases.

Important Issues 3 (#5804)

- Successfully get data from AMC Fetcher:
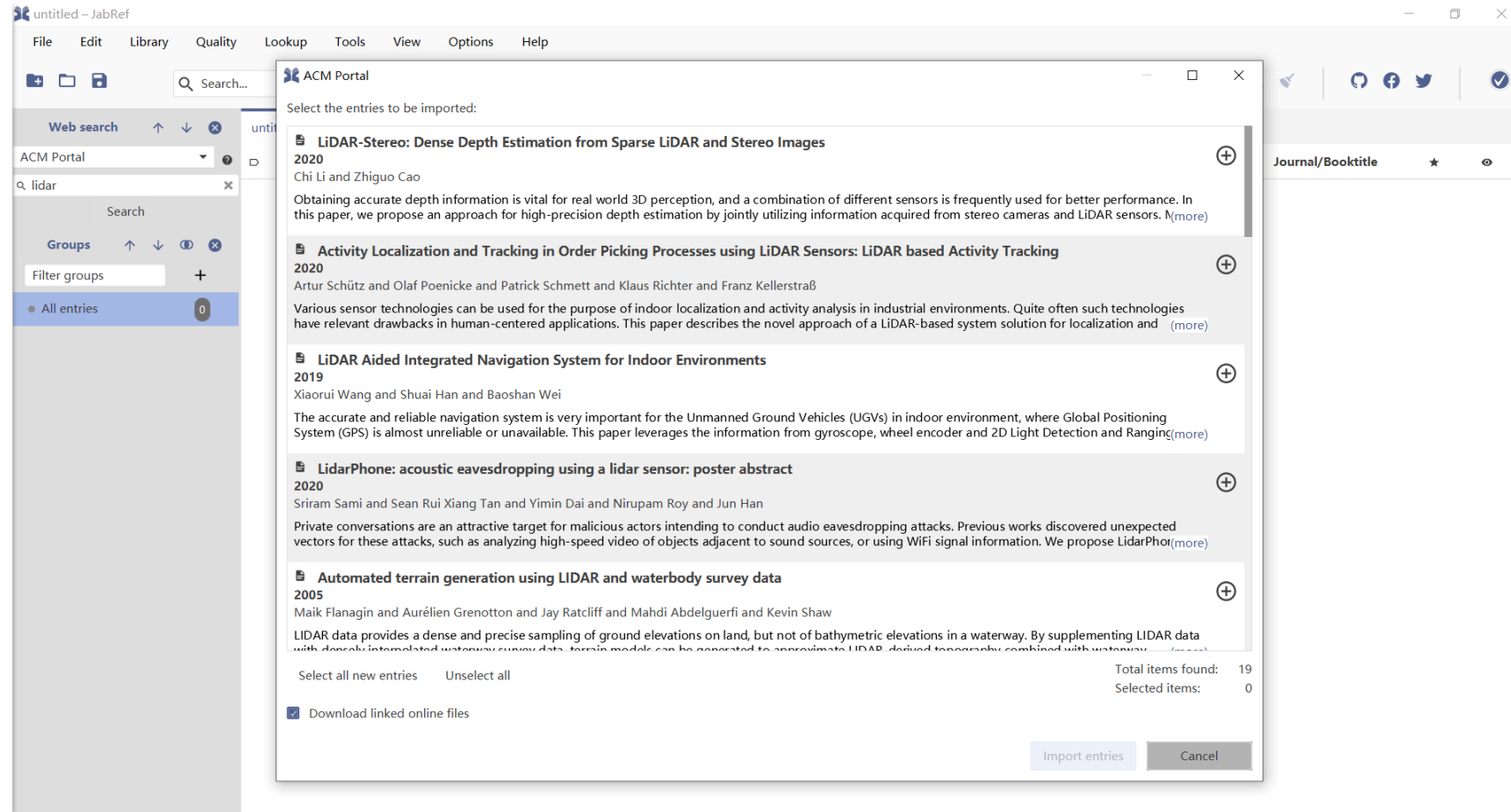
Important Issues 4 (#6877)

- Issue #6877:
  - Related to issue 6376, 6395.
  - Some API rate-limiting JabRef's API key, such as Springer, IEEE.
  - Suggest adding a dialog box that lets advanced users enter their own API keys, to work around the app-limits.

- Pull Request #7720:
  - Add feature: allows the user to customize the API Key in the customization tab of the preferences and check this key.
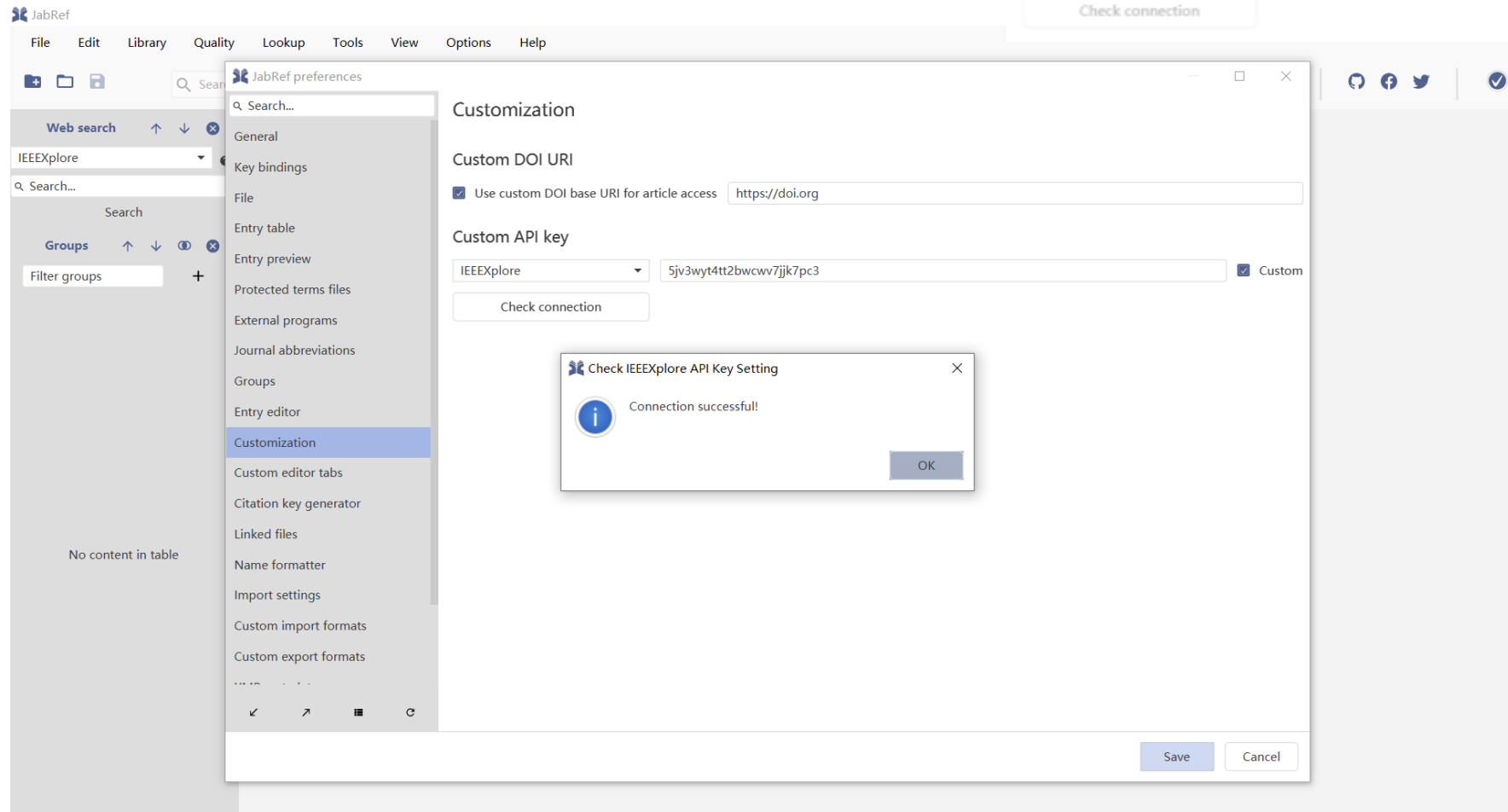
Important Issues 4 （#6877）

- Allows users to customize API Keys in preferences:

Important Issues 4 (#6877)

- Search using a custom Springer API key:
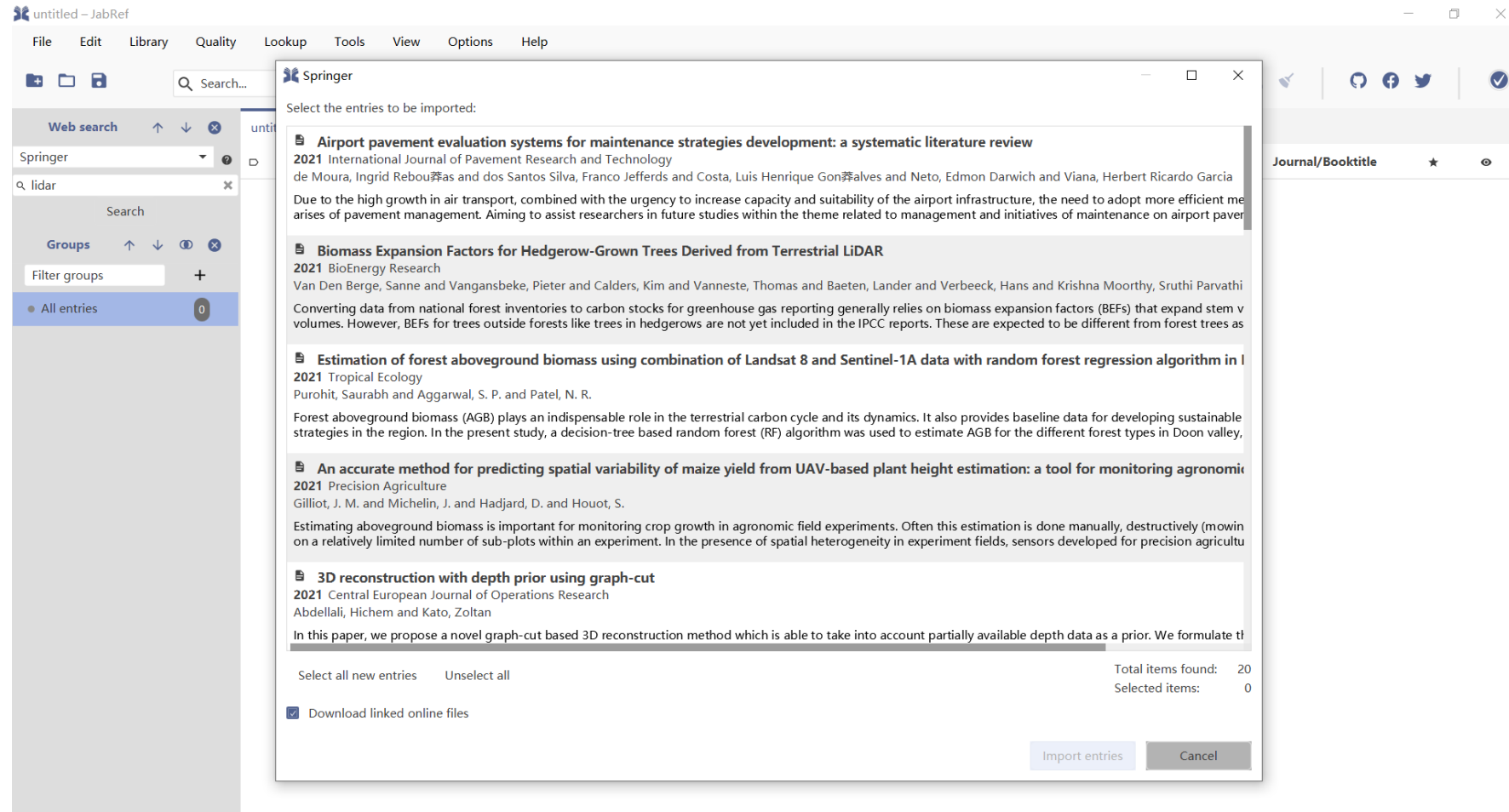
Testing

Techniques: Only manual testing. For some issues related to UI, there are no test cases.

issue   # of test cases
#7395:   3 test cases
#7111:   8 test cases (ParameterizedTest)
#7305:   2 test cases
#6877:   No additional test cases, only modify the existed test cases (6)
#5804:   8 test cases
#7730:   No test cases because it related to the UI.

Testing

screenshots of some test cases(All the test cases are proved passed by jabref's github Action)

```
388  +
389  +        @ParameterizedTest
390  +        @MethodSource("provideArgumentsForFallback")
391  +        void expandBracketsWithFallback(String expandResult, String pattern) {
392  +            BibEntry bibEntry = new BibEntry()
393  +                        .withField(StandardField.YEAR, "2021").withField(StandardField.EPRINT, "2105.02891");
394  +            BracketedPattern bracketedPattern = new BracketedPattern(pattern);
395  +
396  +            assertEquals(expandResult, bracketedPattern.expand(bibEntry));
397  +        }
398  +
399  +        private static Stream<Arguments> provideArgumentsForFallback() {
400  +            return Stream.of(
401  +                    Arguments.of("auth", "[title:(auth)]"),
402  +                    Arguments.of("auth2021", "[title:(auth[YEAR])]"),
403  +                    Arguments.of("not2021", "[title:(not[YEAR])]"),
404  +                    Arguments.of("", "[title:([YEAR)]"),
405  +                    Arguments.of(")]", "[title:(YEAR])]"),
406  +                    Arguments.of("2105.02891", "[title:([EPRINT:([YEAR])])]"),
407  +                    Arguments.of("2021", "[title:([auth:([YEAR])])]")
408  +            );
409  +        }
```

Testing

```
+     @Test
+     public void performSearchByIdFindsEntryWithDraftIdentifier() throws Exception {
+         BibEntry bibDraftEntry = new BibEntry();
+         bibDraftEntry.setType(StandardEntryType.TechReport);
+         bibDraftEntry.setField(InternalField.KEY_FIELD, "fielding-http-spec-01");
+         bibDraftEntry.setField(StandardField.AUTHOR, "Henrik Nielsen and Roy T. Fielding and Tim Berners-Lee");
+         bibDraftEntry.setField(StandardField.DAY, "20");
+         bibDraftEntry.setField(StandardField.INSTITUTION, "Internet Engineering Task Force");
+         bibDraftEntry.setField(StandardField.MONTH, "#dec#");
+         bibDraftEntry.setField(StandardField.NOTE, "Work in Progress");
+         bibDraftEntry.setField(StandardField.NUMBER, "draft-fielding-http-spec-01");
+         bibDraftEntry.setField(StandardField.PAGETOTAL, "41");
+         bibDraftEntry.setField(StandardField.PUBLISHER, "Internet Engineering Task Force");
+         bibDraftEntry.setField(StandardField.TITLE, "{Hypertext Transfer Protocol -- HTTP/1.0}");
+         bibDraftEntry.setField(StandardField.TYPE, "Internet-Draft");
+         bibDraftEntry.setField(StandardField.URL, "https://datatracker.ietf.org/doc/html/draft-fielding-http-spec-01");
+         bibDraftEntry.setField(StandardField.YEAR, "1994");
+         bibDraftEntry.setField(StandardField.ABSTRACT, "The Hypertext Transfer Protocol (HTTP) is an application-level protocol with the lightness and speed necessary for
+         bibDraftEntry.setCommentsBeforeEntry("%% You should probably cite draft-ietf-http-v10-spec instead of this I-D.");
+
+         assertEquals(Optional.of(bibDraftEntry), fetcher.performSearchById("draft-fielding-http-spec"));
+     }
```

```
+     @Test
+     public void performSearchByIdFindsNothingWithValidDraftIdentifier() throws Exception {
+         assertEquals(Optional.empty(), fetcher.performSearchById("draft-test-draft-spec"));
+     }
+
```

Static Analysis Tools

There are some unknown problems when running the analysis on the whole project. So total 49 modified files are tested separately. All the screenshots can be found in the repository.
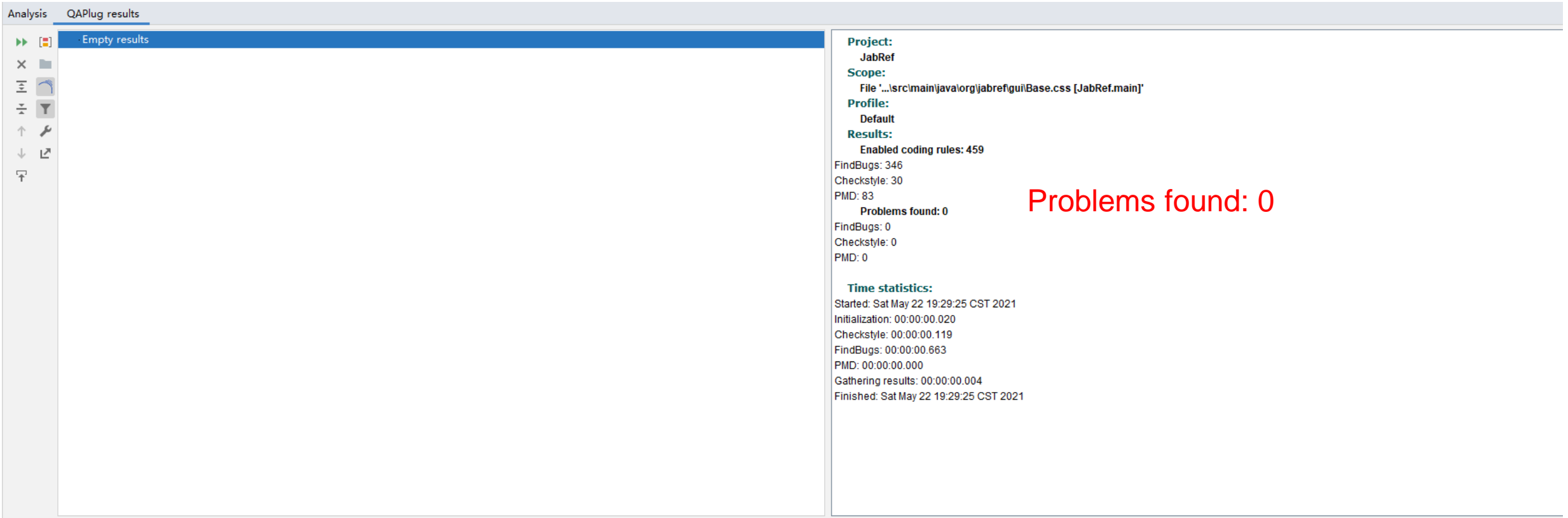

One of the screenshot

Scenarios for #7015

- Relevency is an important feature which need to be viewed as a significant sorting criteron. However, in the previous version of JabRef, the feature can disorder the second sorting criteron.
- At present, JabRef can deal with the relevancy correctly.

|	Entrytype	Author/Editor	Title	Year	Journal/Booktitle	★
	InProceedings	Whitten and Tygar	Why Johnny can't encrypt: a us…	1999	SSYM'99: Proceedings of the 8t…	
	PhdThesis	deBraga	The postcranial anatomy of *Pro*…	2001		
	Article	von Hippel et al.	Article with complex Authorna…	2004	IEEE Security and Privacy	
	Article	Bardram	The trouble with login: on usabi…	2005	Personal Ubiquitous Comput.	
	InProceedings	Boström et al.	Extending XP practices to supp…	2006	SESS '06: Proceedings of the 20…	
	InProceedings	Braz and Robert	Security and usability: the case …	2006	IHM '06: Proceedings of the 18t…	
	InProceedings	Bruschi et al.	Introduction to software engine…	2006	SESS '06: Proceedings of the 20…	
	Article	Clear	Design and usability in security …	2002	SIGCSE Bull.	
	InProceedings	Rozinov	Are Usability and Security Two …	2004		
	Article	Yan et al.	Password Memorability and Sec…	2004	IEEE Security and Privacy	
	Book	Cranor and Garfinkel	Security and Usability	2005		
	InProceedings	de Paula et al.	Two experiences designing for …	2005	SOUPS '05: Proceedings of the …	
	InProceedings	DeWitt and Kuljis	Aligning usability and security: …	2006	SOUPS '06: Proceedings of the …	
	InProceedings	Naedele and Koch	Trust and tamper-proof softwar…	2006	SESS '06: Proceedings of the 20…	
	InProceedings	Nosseir et al.	Question-based authentication …	2006	NordiCHI '06: Proceedings of th…	
	InProceedings	Win et al.	How secure is AOP and what ca…	2006	SESS '06: Proceedings of the 20…	
	InProceedings	Hinds and Ekwueme	Increasing security and usability…	2007	ACM-SE 45: Proceedings of the …	
	InProceedings	Jakubowski and Venkatesan	Randomized radon transforms f…	2007	DRM '07: Proceedings of the 20…	
	Article	Churchill et al.	Useful Computer Security	2008	IEEE Internet Computing	
	InProceedings	Kostakos	Human-in-the-loop: rethinking …	2008	CHI '08: CHI '08 extended abstr…	

Scenarios for #5804

- Support ACM Fetcher: ACM is an important journal, but was disabled in Jabref since its API interface was outdated.
- Right now, Jabref can search the result in ACM.
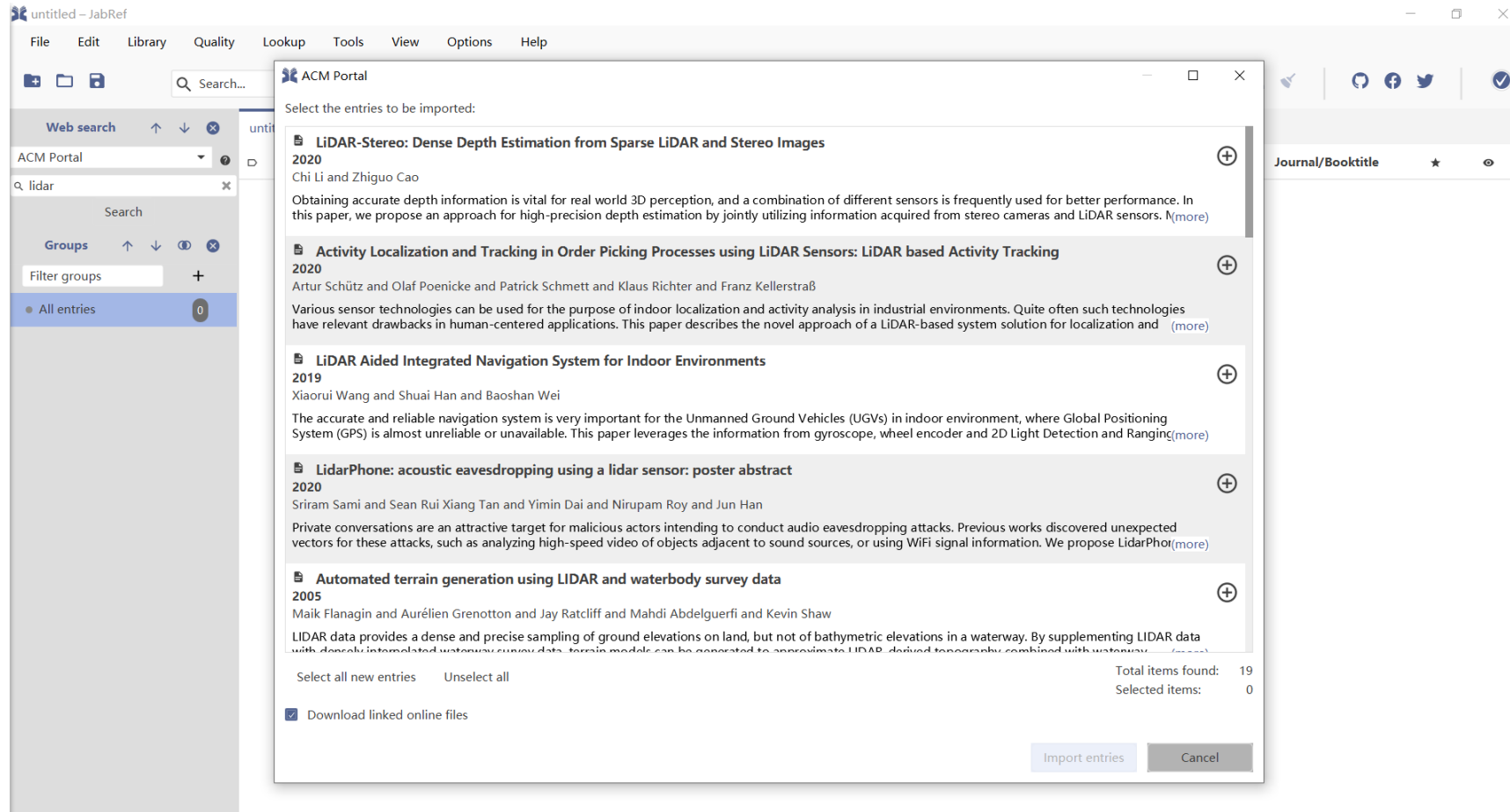
Scenarios for #6877

- Currently, there is no effective way to solve the limit query numbers of jabref's API key.
- If users have their own API keys, it is appropriate for them to use their own keys when the jabref's keys have reached query limit.
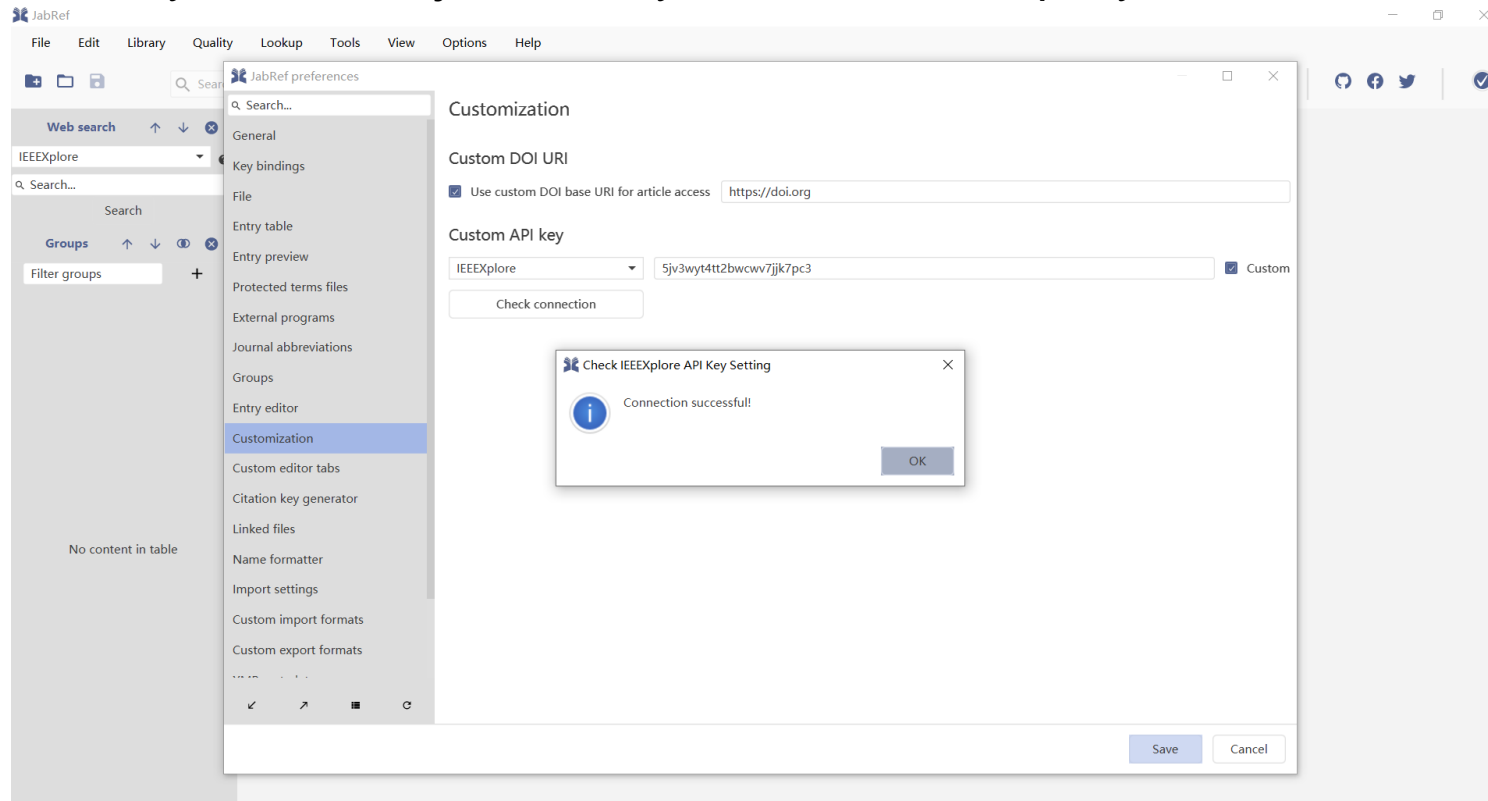
Allows users to customize API Keys in preferences

Scenarios for #6877

Search using a custom Springer API key:
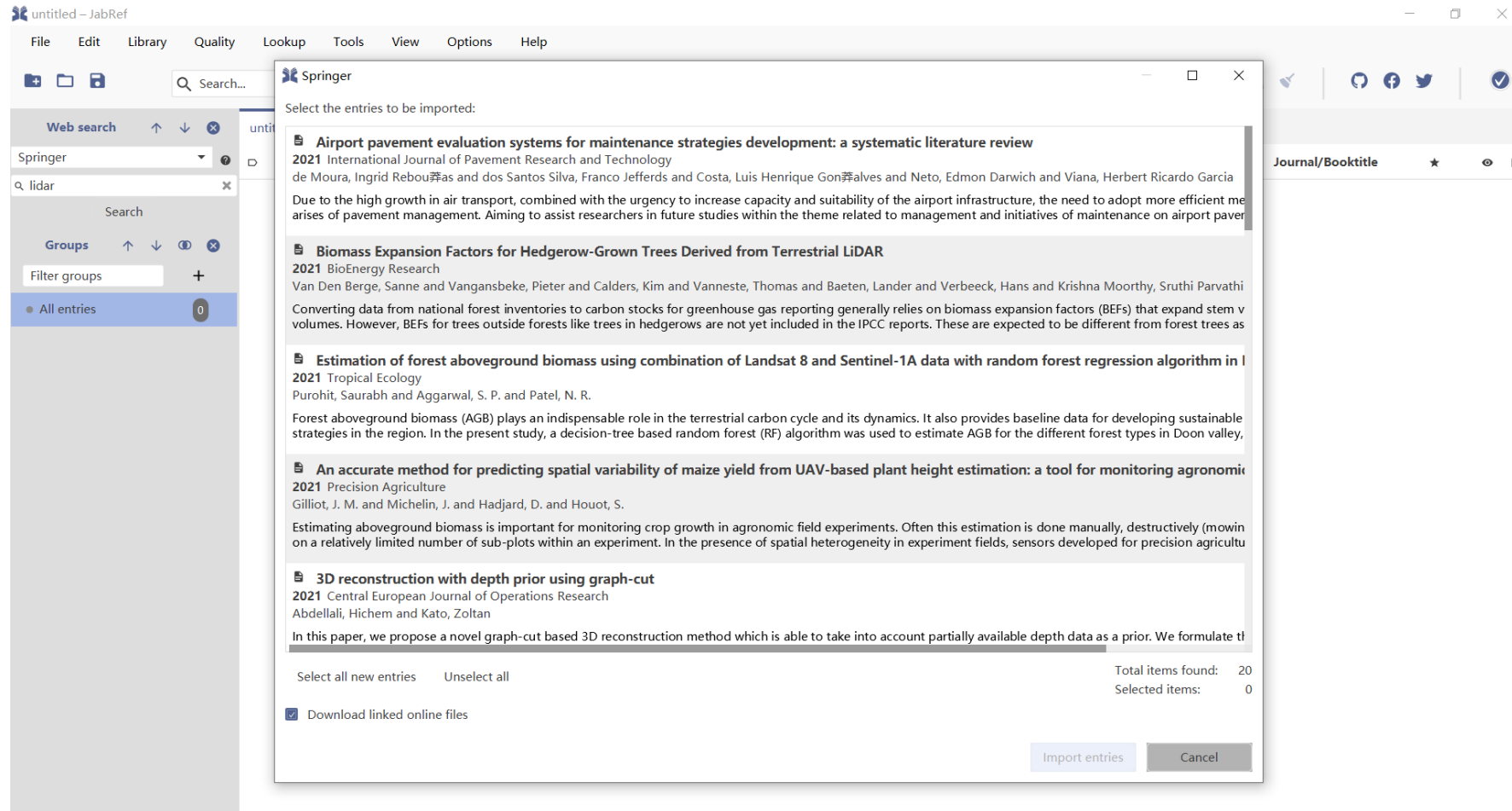
Scenarios for #7111

- Citation key is used for reference in latex. Jabref supports users to define their own generation pattern.

- If user wants to use [EPRINT] as citation key, when the entry does not have this field, then uses [YEAR] to replace it. Before, the workaround is to use regular expression, but the syntax is complicated for most users.

- Right now, users can use the generation pattern: [EPINRT:([YEAR])], which is simple and consistent to the previous logic of generation pattern.

- The user can customize more patterns.

Scenarios for #7111

The pattern is [author:([YEAR])], when the field [Author] is Null, use field [Year] as citation key

Conclusion

- Fix issues for Jabref.

- Total #PR: 16, 10 of them have been merged. Achieved the goal 15 set in the beginning of the semester.

- Communicate with developers in time and learn a lot from this project

Future Work

Q: What lessons did you learn from your project?
A:
1. How to read source code of a large project;
2. How to locate a bug;
3. How to write appropriate test cases;
4. Use analyze tools(like Checkstyle) to guarantee code quality;
5. Communication with developers.

Q: What was difficult?
A:
1. Sometimes the problem is caused by the package used in the project, not the project itself.
2. The logic is complicated and it is hard to decide where the code should be added or modified
3. Not familiar with some techniques(Javafx…)
4. A lot of things(usability, generalization, consistency…) should be considered when design new functions

Future Work

Q: What do you wish you could have done (or done differently)?
A:
1. More teamwork and more specific division of labor may improve the efficiency
2. Refactor the outdated codes although it may take more time

Q: How could your project be extended...what's next? Are there any interesting problems or questions that resulted from your work?
A:
1. Some issues have not been merged yet, keep in touch with developers and try to finish these tasks
2. When fixing issues, some codes are found outdated or even have potential problems. Refactor these old codes.
3. Some packages used in the project are found not working correctly, we can try to change these packages