MOBILE NETWORK PROJECT REPORT Acemap: Reconstruction of Author, Journal, Topic, Venue Function and Layout Update

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Abstract

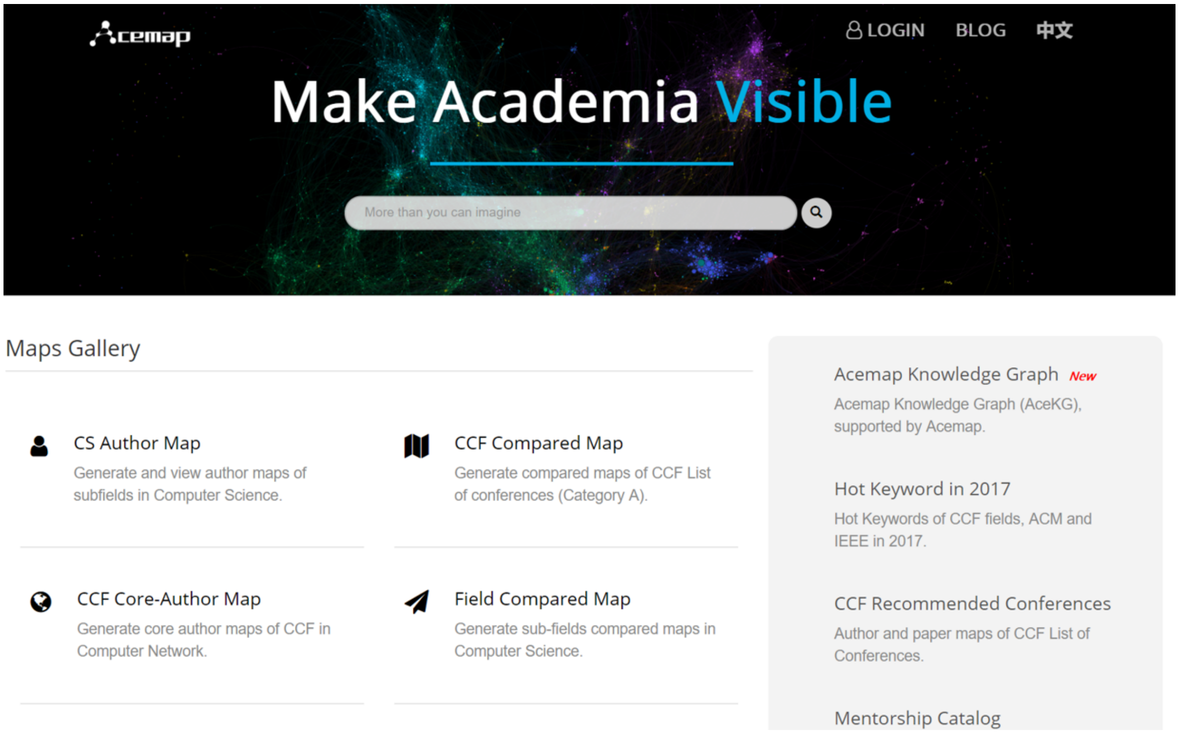
Acemap is an academic paper resource website established by Acemap group of SJTU. It features academic map, adviser-advisee relationships, ranking topic fields and so on. In this project, I lay my eyes on optimization and improvement of the site, including its style, display contents and frameworks, etc. While researching about Acemap, some knowledge about PHP, web frameworks and optimization algorithms are also referred to. The reconstructed and modified Acemap website has a more unified and prominent overall style. The display of results and content is clearer and easier to understand, and the user's visual experience is further improved. Content and typesetting are also more reasonable and can better show the results of Acemap members' research.

Contents

1 Topic Introduction

1.1 Acemap

Acemap is an academic paper resource website established by Acemap group of SJTU. It features academic map, adviser-advisee relationships, ranking topic fields and so on. The homepage is a search engine of papers stored in its massive database. Acemap Knowledge Graph describes more than 1 billion academic entities, 22 billion triplets, and contains greater than 60 million papers, 50 million scholars, 50,000 research fields, 20,000 institutions.



Maps Gallery

CS Author Map
Generate and view author maps of subfields in Computer Science.

CCF Compared Map
Generate compared maps of CCF List of conferences (Category A).

CCF Core-Author Map
Generate core author maps of CCF in Computer Network.

Field Compared Map
Generate sub-fields compared maps in Computer Science.

Acemap Knowledge Graph *New*
Acemap Knowledge Graph (AceKG), supported by Acemap.

Hot Keyword in 2017
Hot Keywords of CCF fields, ACM and IEEE in 2017.

CCF Recommended Conferences
Author and paper maps of CCF List of Conferences.

Mentorship Catalog

Figure 1: Acemap's homepage: Make Academia Visible

Just like what is written on its homepage, Acemap's goal is to make academia visible. This is reflected on its abundant knowledge graphs about academic information. Besides showing searching result in pale lists and words, it provides several graphs to indicate the relationship of the current paper among authors, journals and fields.

The Knowledge Graph is a series of various graphs showing the relationship between the process of knowledge development and structure. It uses visual techniques to describe knowledge resources and their carriers, and to mine, analyze, construct, draw and display knowledge and their interconnections. By combining applied mathematics, graphics, information visualization technology, information science and other disciplines of theory and methods with metrology citation analysis, co-occurrence

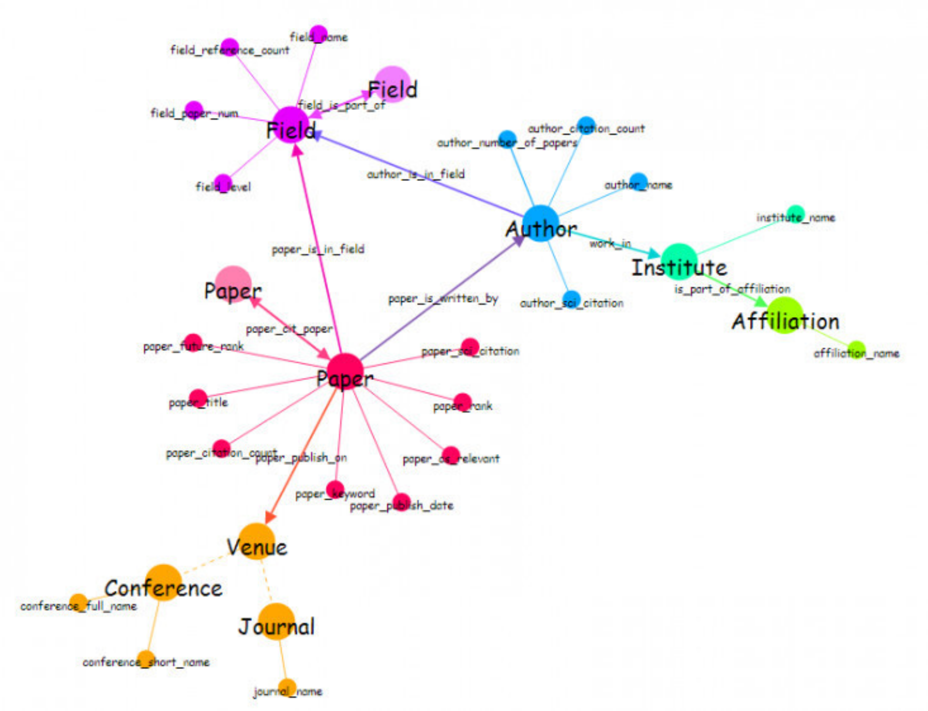


Figure 2: Acemap Knowledge Graph structure

analysis and other methods combined, and the use of visualized maps to visualize the discipline's core structure, development history, frontier The domain and the overall knowledge structure reveal the dynamic development laws in the knowledge domain and provide practical and valuable references for research and decision-making.

Acemap has 3 main features compared to former work:

- It provides academic heterogeneous maps, including diverse academic entities and corresponding attributes, and can support diverse topics of academic big data mining, such as the current topic of heterogeneous network vectorization.

- AceKG looks at the entire academic circle from a higher perspective and provides a data set of approximately 100G in size, including papers, authors, fields, institutions, journals, conferences, alliances, and supporting authoritative and practical academic research.

- AceKG is given in a structured Turtle file format (see the table below for specific format), dedicated to reducing the inconvenience of data preprocessing, and easier to machine processing, supporting all Apache Jena APIs.

1.2 Why and How

As Acemap mainly displays its results on webpage, the application should cater to the users and satisfy their needs. Some congeneric sites like AMiner, Microsoft Academic

Graph(MAG), Open Academic Graph have set up a good example for us, but some subtle improvements can also be applied to Acemap's web display.

To localize and assimilate the advantages of other sites and form a unique style of our own, we can first list a to-do list as follows:

- Views Reconstruction
  - Author
  - Journal
  - Topic
  - Venue
  - ...
- Function and Layout Update
  - Add/delete graphs on the page
  - Cooperatively synthesize results of other students onto server

2 Background

2.1 PHP

Hypertext Preprocessor (or simply PHP) is a server-side scripting language designed for Web development, but also used as a general-purpose programming language.

PHP code may be embedded into HTML code, or it can be used in combination with various web template systems, web content management systems, and web frameworks.

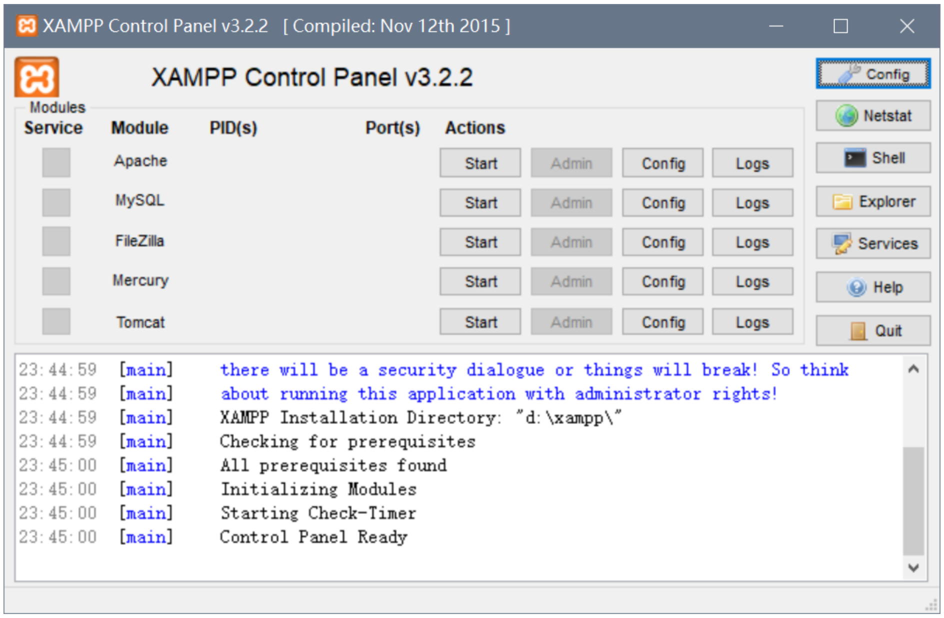
Acemap is constructed based on PHP language. This is the most popular website-building environment nowadays.

2.2 XAMPP

XAMPP is a free and open source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages.

It is the most popular development environment integrated package for web-building purpose. In simple terms, we can regard XAMPP = Apache + MySQL + PHP + Perl.

After configuration, XAMPP enables us to establish a local web server by simply clicking start server in the control panel. First we connect the VPN and start Redis service, and go back to the XAMPP control panel to start Apache module. Then we can visit Acemap locally on *localhost*.


XAMPP Control Panel v3.2.2 [Compiled: Nov 12th 2015]
XAMPP Control Panel v3.2.2
Modules
Config
Netstat
Shell
Explorer
Services
Help
Quit

Service	Module	PID(s)	Port(s)	Actions			
	Apache			Start	Admin	Config	Logs
	MySQL			Start	Admin	Config	Logs
	FileZilla			Start	Admin	Config	Logs
	Mercury			Start	Admin	Config	Logs
	Tomcat			Start	Admin	Config	Logs

```
23:44:59  [main]    there will be a security dialogue or things will break! So think
23:44:59  [main]    about running this application with administrator rights!
23:44:59  [main]    XAMPP Installation Directory: "d:\xampp\"
23:44:59  [main]    Checking for prerequisites
23:45:00  [main]    All prerequisites found
23:45:00  [main]    Initializing Modules
23:45:00  [main]    Starting Check-Timer
23:45:00  [main]    Control Panel Ready
```

Figure 3: Acemap Knowledge Graph structure

2.3 CodeIgniter

CodeIgniter is an open-source software rapid development web framework, for use in building dynamic web sites with PHP.

CodeIgniter is loosely based on the popular modelCviewCcontroller (MVC) development pattern. While controller classes are a necessary part of development under CodeIgniter, models and views are optional.

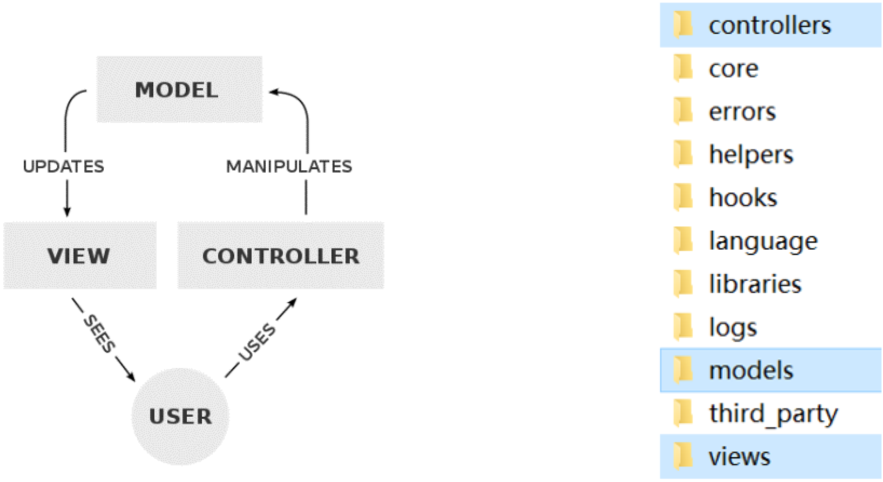


Figure 4: Model, view, controller

- The **model** is the central component of the pattern. It expresses the application's behavior in terms of the problem domain, independent of the user interface. It directly manages the data, logic and rules of the application.

- A **view** can be any output representation of information, such as a chart or a diagram. Multiple views of the same information are possible, such as a bar chart for management and a tabular view for accountants.

- The third part or section, the **controller**, accepts input and converts it to commands for the model or view.

Acemap is constructed under CodeIgniter framework on the purpose of simplify web building process and easy management. So during the development I check the documents of CodeIgniter for most problems.

3 My Work

3.1 Views Reconstruction

3.1.1 CSS Style Improvement

In this section, I have modified the position and display of some elements, making the entire web page more harmonious and thematic. Then I also modified the style of some UIs such as buttons and links. There is an example of css style improvement on the buttons below.

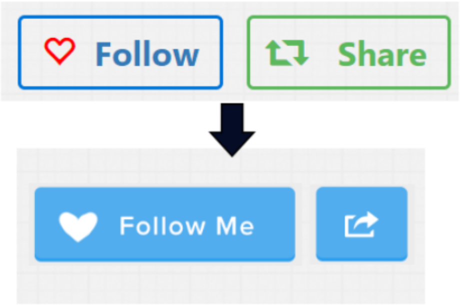
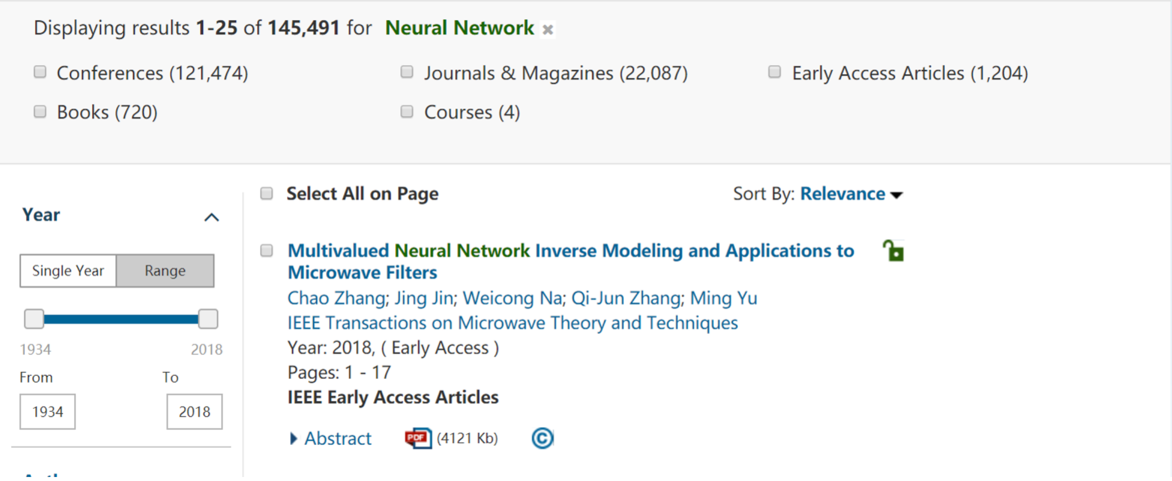


Figure 5: An example of button change

Throughout the fine-tuning process, I mainly referred to the layout and styles of famous paper portals such as IEEE Xplore and Aminer to enhance the overall visual perception of Acemap.


Displaying results **1-25** of **145,491** for **Neural Network** ✖

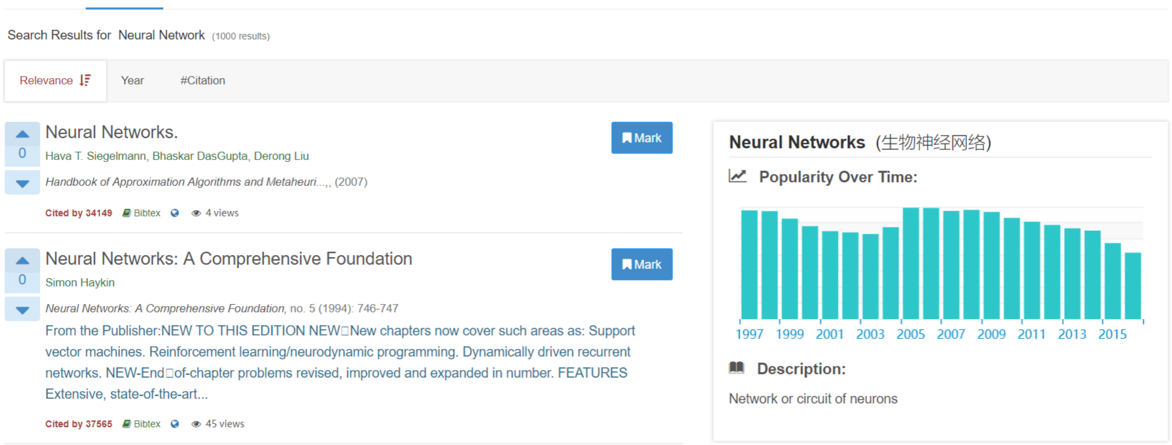
□ Conferences (121,474) □ Journals & Magazines (22,087) □ Early Access Articles (1,204)

□ Books (720) □ Courses (4)

□ **Select All on Page** Sort By: **Relevance**

□ **Multivalued Neural Network Inverse Modeling and Applications to Microwave Filters**
Chao Zhang; Jing Jin; Weicong Na; Qi-Jun Zhang; Ming Yu
IEEE Transactions on Microwave Theory and Techniques
Year: 2018, (Early Access)
Pages: 1 - 17
IEEE Early Access Articles

Figure 6: IEEE Xplore


Search Results for Neural Network (1000 results)

Neural Networks.
Hava T. Siegelmann, Bhaskar DasGupta, Derong Liu
Handbook of Approximation Algorithms and Metaheuri...,, (2007)
Cited by 34149 Bibtex 4 views

Neural Networks: A Comprehensive Foundation
Simon Haykin
Neural Networks: A Comprehensive Foundation, no. 5 (1994): 746-747
From the Publisher:NEW TO THIS EDITION NEW□New chapters now cover such areas as: Support vector machines. Reinforcement learning/neurodynamic programming. Dynamically driven recurrent networks. NEW-End□of-chapter problems revised, improved and expanded in number. FEATURES Extensive, state-of-the-art...
Cited by 37565 Bibtex 45 views

Neural Networks (生物神经网络)

Popularity Over Time:

Description:

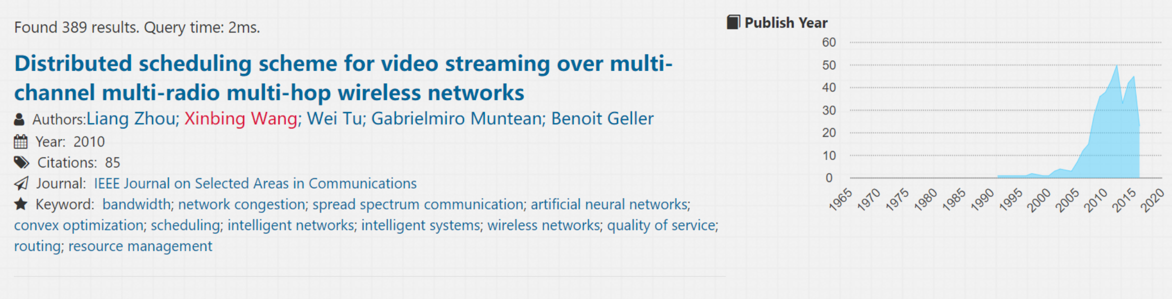
Network or circuit of neurons

Figure 7: Aminer

3.1.2 Display Effect and Layout Improvement

In this part, I fixed some display problems for example, the floating Nav-bar lacks background color in the Venue. Also, I refactored the page layout of authorpage, journalpage, paperpage, etc, such as adjusting the color and layout of the search results page to make it look more distinct and contrasty, allowing users to find the desired information faster.

I also add or modify other display effect according to demands. Another example is that the content richness of the left and right columns of authorpage is inconsistent, so I made some changes to the allocation on both sides and added and removed some modules on both sides.


Found 389 results. Query time: 2ms.

Distributed scheduling scheme for video streaming over multi-channel multi-radio multi-hop wireless networks

Authors:Liang Zhou; Xinbing Wang; Wei Tu; Gabrielmiro Muntean; Benoit Geller

Year: 2010

Citations: 85

Journal: IEEE Journal on Selected Areas in Communications

Keyword: bandwidth; network congestion; spread spectrum communication; artificial neural networks; convex optimization; scheduling; intelligent networks; intelligent systems; wireless networks; quality of service; routing; resource management

Figure 8: Original Acemap

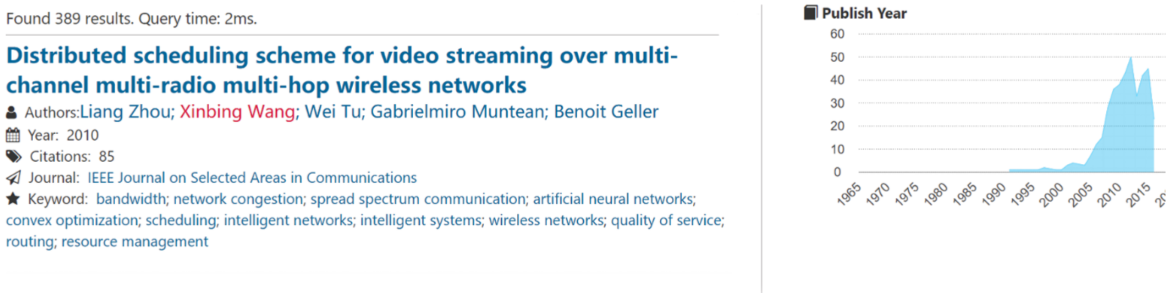

Found 389 results. Query time: 2ms.

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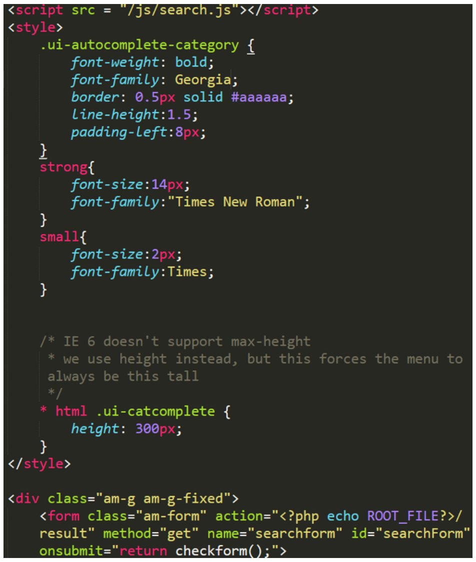
Figure 9: After reconstruction

3.1.3 Front-end Code Clear-up

I read through the code of the related web pages under the *application/controllers* and *application/views* folders in the Acemap project. The code under these two folders is mainly the html/css, JavaScript, and dynamic PHP code at the front end of the web page. These codes form the Acemap website that we can see. During the reading process I slightly unified the style of the code to increase readability.

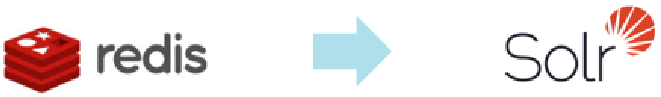

```
<script src = "/js/search.js"></script>
<style>
    .ui-autocomplete-category {
        font-weight: bold;
        font-family: Georgia;
        border: 0.5px solid #aaaaaa;
        line-height:1.5;
        padding-left:8px;
    }
    strong{
        font-size:14px;
        font-family:"Times New Roman";
    }
    small{
        font-size:2px;
        font-family:Times;
    }


    /* IE 6 doesn't support max-height
     * we use height instead, but this forces the menu to
     always be this tall
     */
    * html .ui-catcomplete {
        height: 300px;
    }
</style>

<div class="am-g am-g-fixed">
    <form class="am-form" action="<?php echo ROOT_FILE?>/
    result" method="get" name="searchform" id="searchForm"
    onsubmit="return checkform();">
```

3.2 Other Synthesis Work

Finally, my work includes working with other members of the same group to improve the Acemap website, integrating their results on the server and updating web pages. For example, I assist the team member to replace the search completion engine from Redis to Solr to optimize the recommendation effect.



4 Future Expectation

Generally speaking, the project is far from perfect, and many details are still noteworthy. In the future, I will mainly focus on digging deeper about the performance of the pages and edit the contents it displays. For example, to design the overall unique style and replace the default Bootstrap style sheets. In addition, I will continue on implementing the ideas mentioned and improve the web performance.

5 Conclusion

During the process of this project, I thoroughly understood the content of the website architecture and optimization, content layout, and learned the actual construction and display of a modern website. In the past, my understanding of website construction only stayed at the level of html, css, and js, but this time the reconstruction of Acemap made me really involved in a complete, project-oriented project on web pages. One important step in this project was to read the existing Acemap project files and code, which benefited me a lot and prompted me to learn about PHP and the web framework. Although the entire reconstruction process is still not perfect enough and it is not beautiful enough, this topic has laid a solid foundation for me. I believe the next steps will be more handy!

Reference

[1] http://acemap.sjtu.edu.cn/
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[6] CodeIgniter: Cara Mudah Membangun Aplikasi PHP: ANW Pratama
[7] Fast and parallel webpage layout: LA Meyerovich R Bodik, International Conference on World Wide Web , 2010 :711-720