A Collection of Scholarly Book Reviews from the Platforms of Electronic Sources in Humanities and Social Sciences OpenEdition.org

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Abstract

In this paper, we present our contribution for the automatic construction of the Scholarly Book Reviews corpora from two different sources, the OpenEdition platform which is dedicated to electronic resources in the humanities and social sciences, and the Web. The main target is the collect of reviews in order to provide automatic links between each review and its potential book in the future. For these purposes, we propose different document representations and we apply some supervised approaches for binary genre classification before evaluating their impact.

Keywords: Genre classification, Digital Library, Review, OpenEdition.

1. Introduction

Automatic recommendation of books is a hot topic in natural language processing and information retrieval. It can be performed by combining content analysis and collaborative filtering, for example by taking into account the behavior of the users (browsing, reading or shopping) or by analyzing the user comments and the short reviews on online web sites (bookshops or social networks like LibraryThing) as it has been proposed for the Social Book Search track of INEX evaluation (Kazai, 2011). Unlike previous studies on book recommendation, we are dealing here exclusively with scientific content in the social science domain. We are interested in collecting two kinds of reviews:

- long reviews of scientific books written by expert reviewers in scientific journals;
- short reviews that can be found on the Web or in social media.

These two kinds of reviews express two complementary points of view on a given book: deep expert analysis on the one hand, short reaction representing an opinion on the other hand.

In our knowledge, this will be the first corpus of this kind to be collected and that is freely available (via OAI-PMH access on the OpenEdition.org platform).

This paper is structured as follows: section 1 describes the OpenEdition platform that is the source of the books and the long reviews considered in this study. Section 2 describes the bootstrap corpus that has been manually collected from this platform for supervised learning of genre classification models. Section 3 and 4 present the two processes that have been designed for enriching this first corpus with a supervised approach. Lastly, Section 5 presents some perspectives.

2. Description of the OpenEdition Platforms of Books, Journal Papers and Scientific Blogs

OpenEdition is the umbrella portal for OpenEdition Books, Revues.org, Hypotheses and Calenda, four platforms dedicated to electronic resources in the humanities and social sciences (books, journals, research blogs, and academic announcements respectively). Founded in 1999, Revues.org today hosts over 300 online journals, i.e. over 106,000 articles, proceedings and editorials, 99,900 are in full text in Open Access. Founded in 2009, Hypotheses today hosts 600 blogs fed by a community of 1200 bloggers from around the world. All content is in Open Access. Hypotheses hosts various types of blog: research, fieldwork, seminar, and monitoring blogs etc. The platform itself is organized into linguistic subdivisions which correspond to French-speaking, German-speaking, and Spanish-speaking bloggers.

OpenEdition Books, the newest OpenEdition platform, distributes reference books from publishers in the humanities and social sciences. Its aim is to build an international library in the digital humanities, while encouraging publishers to adopt Open Access in the long term. The platform promotes all cultural domains, through

1 http://www.librarything.com
2 http://www.openedition.org
3 The online publication is made through the conversion of articles into XML TEI and then into XHTML and allows the viewing of the full text in web browsers. The specific technical quality needed for the publishing of scientific texts is provided by many functions: metadata management, multiple indexes, management of endnotes, automatic table of contents, numbering of paragraphs and attribution of DOI.
all historical periods in most scientific languages. By
spring 2014, 1,271 books are available on the
OpenEdition Books platform.
On this platform, some journals and blogs are only
dedicated to book reviews and most of them publish
reviews regularly. If in journals, reviews are pre-classified
and can be easily detected according to metadata, this
is not the case for scientific blogs. Another difficulty in
our building collection task is that neither the journals nor
the blogs have hyperlinks between the reviews and the books
they talk about. Therefore these links have to be
automatically estimated in order to be able to add them to
our book/review corpus.

3. A Collection of Scientific Book Reviews
This section describes the learning corpus we collected
from the OpenEdition platform.
In contrast with other collections of reviews like movie
reviews from popular Web platforms, book reviews
written by and for scientists are much more complex to
process because they are very often themselves long
scientific papers. If it has been shown that movie reviews
(content and quantity) are influenced by movie sales
(Duan & Whinston, 2008), reviewing scientific books is
one of the activities of the researchers. Hence, the reviews
are a very valuable resource for scholarly work in a digital
library context. Here is an extract of such a review:

3.1. Training and Test Corpora
We built a training corpus of documents in French,
pre-classified into two categories, the first one contains a
set of 498 reviews of books and are extracted from the
journals of the OpenEdition's Revues.org platform and
the second, a set of 280 documents that are not reviews but
other scientific papers which can be scientific articles,
editorials, call for papers or full-text books.
We constructed a test corpus from the Revues.org
platform. The purpose of testing on this corpus is to know
how much the classifiers are efficient for identifying new
RVs. It is composed of 200 RVs and 100 s.

3.2. Automatic Identification of Reviews
3.2.1. Basic Textual Features
A major challenge for the textual documents classification
problem is the representation of a document. We used the
bag-of-words representation, the simplest but most widely
used approach. In this case, a document is represented by
a vector of word counts. For the basic configuration, the
order of appearance of the words in the documents is
ignored, all XML TEI tags are removed and the individual
words constitute the classification features. In our case,
the documents more than 160,000 different words. We
used different classification approaches to tackle this
binary genre text classification problem.

3.2.2. Naive Bayes (NB) and Naive Bayes Multinomial
(NBM)
Naive Bayesian method is one of the popular techniques
for text classification (McCallum & Nigam, 1998; Lewis
& Ringnue, 1994). Given a set of training documents \( D \),
each document is considered an ordered list of words. We
use \( w_i(d) \) to denote the word in position \( k \) of document \( d \),
where each word is from the vocabulary \( V = \{ w_1, w_2, \ldots, w_N \} \). The vocabulary is the set of all words we consider
for classification. Let \( C = \{ C_1, C_2, \ldots, C_C \} \) be the classes
(in our case, \( C = \{ \text{RV}, \text{NonRV} \} \) and the classification is
binary). In order to perform classification, we need to
estimate the posterior probability \( P[c_j | d] \). Assuming that
the probabilities of the words are independent:

\[
P[c_j | d] = \frac{1}{\sum_{c_k} P[c_k] \prod_{k=1}^{\|} P[w_i(d) | c_k]} 
\]

by employing Laplacian smoothing:

\[
P[w_i | c_j] = \frac{\sum_{d=1}^{\|} N(w_i, d) P[c_j | d]}{\sum_{d=1}^{\|} \sum_{i=1}^{\|} N(w_i, d) P[c_j | d]} 
\]

where \( N(w_i, d) \) is the frequency of the words \( w_i \) in
document \( d \). The class with the highest \( P[c_j | d] \) is assigned
as the class of the document. (Liu et al., 2002)

3.2.3. Support Vector Machines (SVM)
SVM designates a learning approach introduced by
Vapnik in 1995 for solving two-class pattern recognition...
problem (Vladimir et al., 1995). The SVM method is based on the Structural Risk Minimization principle (Vladimir et al., 1995) from computational learning theory. In their basic form, SVMs learn linear threshold function. Nevertheless, by a simple “plug-in” of an appropriate kernel function, they can be used to learn linear classifiers, radial basic function (RBF) networks, and three-layer sigmoid neural nets. (Joachims et al., 1998)

3.2.4. Decision Trees (DT)
A decision tree is a tree in which each branch node represents a choice between a number of alternatives, and each leaf node represents a decision. For each attribute from the training set the training algorithm finds the normalized information gain ratio (difference in entropy) and creates a decision node that most effectively splits the data, then it repeats the same operation recursively on the remaining samples obtained from the previous splitting (Quinlan, 1993).

3.3. Expanding the collection of long reviews by means of automatic classification
Based on the structured documents (XML-TEI), different techniques can be applied for automatic classification. One of the most popular machine learning method tackling this problem is the Multinomial Naive Bayes model. Faced with the great variety of document styles present on the two platforms and the multitude of languages, we have tested several approaches. The hypothesis is that classifying texts as reviews can be accomplished by taking into account the lexicon (a common lexicon for the majority of the reviews) of the book. This differs from classical customer review analysis (Hu & Bing, 2004) in the sense that no clear “product feature” can be given as an input to detect and to analyse reviews. In the following section, we summarize the experiments and the results we obtained.

3.4. Classification Results on OpenEdition.org
The objective of this study is to establish a methodology to well identify RV of book in the Revues.org platform. After removing all XML TEI tags present in the documents and indexing the collection using the “bag-of-words” approach.

For the construction of the Naive Bayes Multinomial (NBM), SVM and DT models, we used Weka4 and report hereafter the results we obtained with the default parameters. The automatic classification result is evaluated using precision, recall and F-measure for each class (RV, NonRV).

|               | RV       |          | NonRV    |          |
|---------------|----------|----------|----------|----------|
|               | Recall   | Precision| F-measure| Recall   | Precision| F-measure |
| NBM           | 91%      | 96%      | 93,43%   | 81%      | 64%      | 71,5%     |
| NB            | 93%      | 85,3%    | 89%      | 68%      | 82,9%    | 74,7%     |
| SVM (RBF)     | 98,5%    | 94,3%    | 96,3%    | 88%      | 96,7%    | 92,1%     |
| SVM           | 98%      | 97%      | 97,5%    | 94%      | 95,9%    | 94,9%     |

Table 1. Evaluation of classification performance for RV and NonRV classes using Revues.org collection test

We compared the performance of the different learning methods commonly used for text classification. Each method represents a different machine learning approach: density estimation using a NB/NBM classifier, the SVM method using RBF and linear kernels and the Decision Tree/rule learner. The first line of Table 1 shows the results of the 10-fold cross validation on the training set using NBM algorithm and the other lines show the results of the NB, SVM (RBF/linear kernels) and DT classifiers on the Revues.org test corpus.

We observe that on the Revues.org test collection the SVM classifiers perform best among the other classifiers. The SVM with RBF and linear kernels classifiers have identified respectively 197,198/200 RV and 88,94/100 NonRV, the DT classifier was able to detect 189/200 RV and 86/100 NonRV, whereas the NB classifier, 186/200 RV and 71/100 NonRV were correctly predicted.

When analysing the documents wrongly classified, we noticed that the classifiers fail in the case of documents having some citations in other languages than French. This experiments have allowed to find out what method is promising for well identifying RV of books. However, we choose the SVM (with the linear kernel) method to detect the RV in all OpenEdition platforms because it tackles many problems like the high dimensional input space, the multitude of irrelevant features existing in the bag of words and the case when the document classification problem is linearly separable.

4. Searching for Book Reviews on the Web
Our second purpose is to build a collection of reviews from the Web and not only from the OpenEdition platforms by finding on-line reviews of each OpenEdition book. The main problem holds in the absence of obvious features which make us capable to determine whether a Web page is a review or not.

For this purpose, we chose about 127 books classified in 3 categories: 49 books about environment, 63 about sociology and 15 about information science. Then, we queried Google Web Search by concatenating the title of the book (exact phrase search) and the name of all its authors, we added the keyword “review” for the English books but not for the French ones because we remarked that it could increase in the most of cases the possibility of delaying the appearance of the review in the ranking result. We then downloaded the first 20 Web pages for each book and performed a manual annotation. This annotation was performed by one expert in this domain, we didn’t ask another experts to give their evaluation because of the simplicity of determining if a web page is review or not and this corpus is still a test corpus for evaluating the difficulty of this task in such context.

2000 Web pages were manually evaluated and classified into several classes such as: review, advertisement,
interview, bibliography or even 'access denied'. We filtered out all advertising Web pages which never contain any good review of book. In the 600 remaining pages we used for classification learning, 97 are reviews of books.

4.1. Feature selection

For each retrieved Web page, we kept its URL and its HTML content. Three feature sets have been considered:

- A. We deleted all HTML and Java Scripts tags in the Web pages.
- B. We employed Boilerpipe (Kohlschütter et al., 2010) for extracting the actual content of the Web pages.
- C. We used only the words in the URLs as features.

4.2. Results

We tested four different classification approaches (Naive Bayes, Naive Bayes Multinomial, SVM, Decision Tree). Table 2 presents the precision, recall and F-measure for the two classes Review (RV) and Not-Review (NotRV).

We remark that SVM classifier gives the best result with the feature set B. The F-measure of non reviews is always better than F-measure of reviews. For the purpose of building a collection of reviews automatically, the scores of the RV class is the more important.

4.3. Perspectives: Linking Reviews to Books with BILBO

Once a document has been classified as a long scientific review, we have to link it with an identifier of the book reviewed. This process is not straightforward as a lot of ambiguities can occur.

Our reference parsing software BILBO (Kim et al., 2011) is employed in order to detect bibliographic references in the reviews and to obtain the DOI of the corresponding book via CrossRef® API if such an identifier exists. BILBO is constructed with our own annotated corpora from Digital Humanities articles from the OpenEdition Revues.org platform. The robustness of BILBO (Kim et al., 2012a), based on linear-chain conditional random fields, allows largely a language independent tagging. Our preliminary results seem to show that the quality of linking references to books via BILBO and CrossRef is good enough to be deployed (> 80% of the links are correct).

6 Conclusion

We have presented two collections of book reviews: the first one was extracted from OpenEdition Platform in XML/TEI format, these reviews, along with metadata, can be freely downloaded (OAI-PMH) and can be used for further analysis (opinion mining, recommendation...). The second collection was collected from the Web using Google and a generated query. These reviews, along with metadata, can be freely downloaded (please contact the authors) and can be used for further analysis (opinion mining, recommendation...). We presented the classification results we obtained by means of classical machine learning approaches for text classification that allowed to extend the collections of reviews.

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5 The number of real pages decreased to 576 because of some empty documents generated by Boilerpipe (88 reviews and 488 not-reviews).

6 http://www.crossref.org
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**Appendices**

Example of French Review of Book from Revues.org Platform:

[-]

<body>

<p>L'ouvrage de A.F. Robertson peut être perçu comme un avatar de ces démarches régénératrices d'une anthropologie préconçue moribonde et pour laquelle la cure oscille entre la recherche de nouveaux champs d'étude et la "revisitation" d'objets anciens. L'auteur opte explicitement pour cette première approche puisqu'il se propose d'étudier le développement planifié dans une perspective anthropologique "comme un système symbolique C...", un ensemble de catégories visant à manipuler les gens et les ressources dans l'espace et le temps" (p.87). L'ouvrage débute par un long chapitre dans lequel est exposée l'histoire des idées et des politiques de développement.</p>

<p>Dans le chapitre consacré aux organisations il présente les éléments d'une problématique qui appréhende les bureaucraties (instruments de l'application des politiques de développement) et les communautés locales (champs d'application des politiques) comme des arènes politiques, des lieux de compétition entre acteurs sociaux. L'apport le plus original de l'ouvrage est sûrement cette idée de la confrontation entre deux formes de planification : celle de l'État et celle du "people", comme nœud de la contradiction inhérente à l'aménagement du territoire en paysage et dans le cadre de la réalisation du projet de plan. Il est regrettable que l'auteur n'investige pas davantage les formes locales de planification notamment dans l'étude du cas malais qu'il présente. Malgré la faiblesse de cet aspect de la démonstration et le flou qui entoure parfois les conditions d'application de l'anthropologie au contexte de développement, le texte de A. F. Robertson est fondateur en ce qu'il explore de manière exhaustive et pertinente un domaine délaissé par l'académisme anthropologique.</p>

</body>

Example of French Review of Book from the Web:

[-]

1. Cet ouvrage préfacé par la géographe et sociologue, Jacqueline Coutras, et dirigé par Sylvette Deneufele, sociologue à l'université François-Rabelais, est la restitution du colloque interdisciplinaire « Femmes et villes » qui s'est déroulé au Palais des Congrès de Tours les 8 et 9 mars 2002, en regroupant une soixantaine de participants. « Les femmes dans la ville » (pp. 25-179), « Rien n'est jamais gagné (pp. 180-356) et « Rien n'est jamais perdu » (pp. 357-539), sont les trois grandes parties qui structurent le livre et regroupent trente-cinq contributions. Le cœur de la réflexion est axé sur des lectures croisées d'études urbaines et de travaux concernant le genre, et sur les usages de la ville et leurs conséquences par rapport aux évolutions sociales. 2. Femmes et villes offre donc une multiplicité d'approches théoriques, méthodologiques et thématiques, fort intéressantes, mais du coup impossibles à résumer. Ceci posé, les pratiques féminines et masculines - qui semblent « normales et naturelles » (Deneufele, p. 15) aux usagers d'un espace urbain - confrontées aux pratiques urbaines pouvant modifier, conforter ou transformer les normes sociales de sexe, sont un des dénominateurs communs de l'ouvrage et dévoilent « l'extrême complexité de l'intrication des systèmes normatifs » (Ibid., p. 16). De même, la plupart des contributions mettent en perspective l'intérêt à prendre en compte la dimension du genre dans les comportements urbains, notamment du côté de l'action politique pour repenser l'aménagement du territoire en fonction des usages sexués de la ville. Car ce qui est illustré ici, par des études de cas ou des enquêtes, est un large panorama des marques de l'assignation féminine dans les villes selon différents espaces : espace domestique (Bauhardt, pp. 41-49 ; Corbeau, pp. 167-179 ; Diaz, Plat, Pochet pp. 135-153 ; Dussuet, pp. 359-378 ; Robin, pp. 65-75), espace du partage des pouvoirs (Bigoteau, Roux, pp. 325337 ; Leginard, pp. 339-356 ; Naceur, pp. 239-247 ; Nigaud, Ripoll, pp. 489-499 ; Salidi-Sharouz, pp. 443-452), espace
contre-courant de ce qui est régulièrement déversé dans pas minimisés en tant que tels, ils vont à ces violences, en ce sens que même si les actes ne sont femmes par des hommes propose une lecture nouvelle de présentation chiffrée de la violence exercée contre les physiques (vols, coups, menaces avec arme). Cette violences ou tentative de viol) et à 1,7 % victimes d'agressions sexuelles (attouchements sexuels, victimes que celles qui habitent une maison immeubles collectifs en ville sont plus fréquemment violence [...], que les femmes qui habitent dans des 59 ans et résidant en métropole, l'étude tend à ici par Florence Maillochon (pp. 207-223), rapport coordonné par l'Institut de sociospatiales. Dès lors, si dans leurs pratiques, les femmes excluent certains espaces ou en sont exclues, elles s'en approprient d'autres par défaut. Ce sont ces parcours au féminin que propose cet ouvrage, auxquels le lecteur est invité à découvrir les méandres comme principaux coupables de [la] montée du sentiment d'insécurité » (Camus : 225), auprès des femmes surtout, tentent d'expliquer pourquoi l'espace urbain favorise ces stéréotypes. Mais peut-être faut-il aussi reconsidérer toutes ces analyses au prisme d'éléments non comptabilisés dans les études et les enquêtes des chercheurs(ses). Car certains sévices commis ne sont ni dits ni connus, et ne peuvent donc être pris en compte dans les statistiques officielles. 5 Dés lors, si dans leurs pratiques, les femmes excluent certains espaces ou en sont exclues, elles s'en approprient d'autres par défaut. Ce sont ces parcours au féminin que propose cet ouvrage, auxquels le lecteur est invité à découvrir les méandres comme principaux coupables de [la] montée du sentiment d'insécurité » (Camus : 225), auprès des femmes surtout, tentent d'expliquer pourquoi l'espace urbain favorise ces stéréotypes. Mais peut-être faut-il aussi reconsidérer toutes ces analyses au prisme d'éléments non comptabilisés dans les études et les enquêtes des chercheurs(ses). Car certains sévices commis ne sont ni dits ni connus, et ne peuvent donc être pris en compte dans les statistiques officielles. 5 Dés lors, si dans leurs pratiques, les femmes excluent certains espaces ou en sont exclues, elles s'en approprient d'autres par défaut. Ce sont ces parcours au féminin que propose cet ouvrage, auxquels le lecteur est invité à découvrir les méandres comme principaux coupables de [la] montée du sentiment d'insécurité » (Camus : 225), auprès des femmes surtout, tentent d'expliquer pourquoi l'espace urbain favorise ces stéréotypes. Mais peut-être faut-il aussi reconsidérer toutes ces analyses au prisme d'éléments non comptabilisés dans les études et les enquêtes des chercheurs(ses). Car certains sévices commis ne sont ni dits ni connus, et ne peuvent donc être pris en compte dans les statistiques officielles.