Northern Illinois University

Poster Design Workshop

Design Your Research/Artistry Poster

Office of Student Engagement and Experiential Learning
Overview

• Why create a poster?
• Poster standards
• Poster sections:
  – Title, abstract/overview, methods, findings/results, conclusions, acknowledgements
• Poster “Dos”
• Poster “Don’ts”
• Examples
• Final thoughts
Why create a poster?

• Provide overview of your project
• Presenting at a:
  – research conference
  – workshop
  – poster session
• Visual aid to go with short presentation
Poster overview

• Provide overview of your project
• Share your methods, step-by-step (brief)
• Present your findings/results
  – Graphs
  – Charts
  – Pictures
• Provide a short conclusion and future work
• Acknowledge those that helped you
  – Mentor
  – Department/program (e.g., URA program)
  – Funding
• Catch the eye of people passing by
Poster requirements

• 32” by 40” (URAD required size)
• Submitted to Media Services by Monday, April 7, 2014 (URAD poster deadline)
• NIU logo
Title

- At least 2” wide (120-150 font, if possible)
  (Should be able to read from 15-20 feet)
- San Serif font (ex: Arial)
- Two lines or less
- Centered
- Only lead letter is capitalized (and proper nouns)
- Author(s) underneath
The impact of the number of subjects for atlas-based automatic segmentation

J L Ducote, V Sehgal, J Wong, M Al-Ghazi

Department of Radiation Oncology, University of California Irvine, Orange, CA

Abstract

Purpose: To determine the impact of atlas size on the performance of atlas-based automatic segmentation (ABAS) in delineation of organs at risk for radiation therapy.

Methods: A total of 25 patients who had undergone intensity-modulated radiation therapy for head and neck cancer were retrospectively selected for inclusion in a library to be used for ABAS with the MM VISTA software package (MMV Software, Cleveland, OH). Treatment planning computed tomography (CT) scans and subsequent organ at risk (OAR) contours were generated as part of the treatment planning process for these patients and added to the library. This library of 25 patients was then successively pruned to generate 5 atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem contours. Three planning CT scans belonged to a unique set of 10 patient subjects different from the ones used for generating the atlases. One physician (JW), who was blinded to the ABAS results, manually delineated gold-standard contours for the right and left parotid glands and brainstem. Dice similarity coefficients were calculated and analyzed as a function of atlas subject size.

Results: For the sites selected in this study, the performance of ABAS was relatively insensitive to atlas size. Furthermore, some patient subjects were repeatedly selected implying that the adoption of a single standard patient for ABAS may be of benefit.

Conclusions: Our preliminary results indicate that the performance of the atlas-based segmentation module in MM VISTA Version 5.2 for the organs studied here may be relatively insensitive to the atlas size.

Introduction

Increasing sophistication of radiation therapy treatment plans require precise methods of target and organs at risk (OAR) delineation and is inherently resource intensive. Atlas-based automatic segmentation (ABAS) has the potential to facilitate this process and offers the possibility to improve efficiency as well as reduce inter- and intra-observer variations in delineated contours [1][2]. To this end we have evaluated the ABAS capabilities of the MM VISTA software package - version 5.2 (MMV Software, Cleveland, OH). In this study, we attempted to determine the optimal number of subjects needed to achieve high conformity and confidence in the performance of ABAS.

Fig. 1. A comparison of physician drawn manual contours (red) and those generated by ABAS (yellow). Contour agreement is shown in shaded blue.

Methods

OAR contours and underlying CT scans for a total of 25 head and neck cancer patients were added to a library to be used for ABAS. The library of 25 patients was then successively pruned, at random, to generate five atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem. These were compared to the contours manually delineated by a physician (JW), who was blinded to the ABAS results. Dice similarity coefficients (DSC) were calculated and analyzed as a function of atlas subject sizes for brainstem and parotid gland contours. DSC values were calculated as follows:

\[ DSC(X, Y) = \frac{2 |X \cap Y|}{|X| + |Y|} \]

Where X and Y represent the manual drawn contour and the ABAS generated contour, respectively, and |X| and |Y| represent the intersection of X and Y. A DSC value of 1 represents perfect overlap.

Fig. 2. Strength of Dice similarity coefficients as a function of atlas size for brainstem contours. The data were related by \( Y = 0.01 X + 0.85 \) (R² = 0.99). The average DSC value across the range was approximately 0.69.

Fig. 3. Strength of Dice similarity coefficients as a function of atlas size for parotid gland contours. The data were related by \( Y = 0.01 X + 0.96 \) (R² = 0.98). The average DSC value across the range was approximately 0.69.

Results

Conclusions

For the sites selected in this study, the performance of ABAS was fairly insensitive to atlas size. Little to no additional benefit was observed in generating atlases with a greater number of subjects. Furthermore, during ABAS some patient subjects in an atlas were repeatedly selected as the diceset match, implying that the adoption of a small number of subjects for atlas generation may be of benefit when using ABAS for selected populations.

References

2. LC Andrews, F. Bender, R. C. Webster, L. R. Coon, JJ. Thyroid and Oncology 102, 65-73 (2012)

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NIU CHAO FAMILY COMPREHENSIVE CANCER CENTER
UNIVERSITY OF CALIFORNIA - IRVINE
A National Cancer Institute-Designated Comprehensive Cancer Center
Abstract/Intro/Background

• Can include your Abstract at beginning
  – Should match what is submitted to the booklet
  – Some disciplines DO NOT put abstract on poster, check with your mentor
• Intro/Background: provides an overview of what your project entails
• These sections combined should not take up more than 1 column
The impact of the number of subjects for atlas-based automatic segmentation

J L Ducote, V Sehgal, J Wong, M Al-Ghazi

Department of Radiation Oncology, University of California Irvine, Orange, CA

Abstract

Purpose: To determine the impact of atlas size on the performance of atlas-based automatic segmentation (ABAS) in delineation of organs at risk for adaptive radiation therapy.

Methods: A total of 25 patients who had undergone intensity-modulated radiation therapy for head and neck cancers were retrospectively selected for inclusion in a library to be used for ABAS with the MIM VISTA software package (MIM Software, Cleveland, OH). Treatment planning computed tomography (CT) scans and subsequent organ at risk (OAR) contours generated as part of the treatment planning process for these patients were added to the library. The library of 25 patients was then successively pruned to generate five atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem contours. These planning CT scans belonged to a unique set of 10 patient subjects different from the ones used for generating the atlases. One physician (JV), who was blinded to the ABAS results, manually delineated gold-standard contours for the right and left parotid glands and brainstem. Dice similarity coefficients were calculated and analyzed as a function of atlas size.

Results: For the sites selected in this study, the performance of ABAS was relatively insensitive to atlas size. Furthermore, some patient subjects were repeatedly selected implying that the adoption of a single standard patient for ABAS may be of benefit.

Conclusions: Our preliminary results indicate that the performance of the atlas-based segmentation module in MIM VISTA Version 5.2 for the organs studied here may be relatively insensitive to the atlas size.

Introduction

Increasing sophistication of radiation therapy treatment plans require precise planning and organ at risk (OAR) delineation, and is inherently resource intensive. Atlas-based automatic segmentation (ABAS) has the potential to facilitate this process and offers the possibility to improve efficiency as well as reduce inter- and intra-operator variations in delineated contours [1, 2]. In this study, we evaluated the ABAS capabilities of the MIM VISTA software package version 5.2 (MIM Software, Cleveland, OH). In this study, we attempted to determine the optimal number of subjects needed to achieve high conformity and confidence in the performance of ABAS.

Methods

OAR contours and underlying CT scans for a total of 25 head and neck cancer patients were added to a library to be used for ABAS. This library of 25 patients was then successively pruned, at random, to generate five atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem. These were compared to the contours manually delineated by a physician (JV), who was blinded to the ABAS results. Dice similarity coefficients (DSC) were calculated and analyzed as a function of atlas size.

Results

The strengths of the linear fits were observed to be only weakly correlated with the number of subjects in each atlas. After it was observed during patient subject selection that the computer algorithm would often repeatedly select the same patient as the best match for contour adaptation, given that the performance as measured by the similarity coefficients was relatively insensitive to atlas size, it was suggested that careful selection of a small number of atlas subjects may be of benefit in reducing the time needed to perform ABAS. The data also suggested other methods of improving ABAS performance were warranted to take advantage of a larger number of available subjects in an atlas. One option being investigated in our department is the selection of more than a single subject for contour adaptation with the union of contours generated from the two or more atlas datasets being expected to improve the overall similarity coefficient values.

Conclusions

For the sites selected in this study, the performance of ABAS was fairly insensitive to atlas size. Little to no additional benefit was observed in generating atlases with a greater number of subjects. Furthermore, during ABAS, some patient subjects in an atlas were repeatedly selected as the closest match, implying that the adoption of a small number of patients for atlas generation may be of benefit when using ABAS for select populations.

References


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Methods

- Provide an overview of how you conducted your research
- Should be understood by an expert in your field as well as someone with no prior experience
- Might include images/diagrams
Methods

The impact of the number of subjects for atlas-based automatic segmentation

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Abstract

Purpose: To determine the impact of atlas size on the performance of atlas-based automatic segmentation (ABAS) in delineation of organs at risk for adaptive radiation therapy.

Methods: A total of 26 patients who had undergone intensity-modulated radiation therapy for various head and neck cancers were retrospectively selected for inclusion in a library to be used for ABAS. The library of 26 patients was then successively pruned, at random, to generate five atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem contours. These planning CT scans belonged to a unique set of 10 patient subjects different from the ones used for generating the atlases. One physician (JW), who was blinded to the ABAS results, manually delineated gold-standard contours for the right and left parotid glands and brainstem. Dice similarity coefficients were calculated and analyzed as a function of atlas subject size.

Results: For the sites selected in this study, the performance of ABAS was not sensitive to atlas size. Furthermore, some patient subjects were repeatedly selected implying that the adoption of a single standard patient for ABAS may be of benefit.

Conclusions: Our preliminary results indicate that the performance of the atlas-based segmentation module in the prostate atlas in MMVISTMA Version 5.2 for the organs studied here may be relatively insensitive to the atlas size.

Introduction

Increasing sophistication of radiotherapy treatment plans require precise methods of target and organ at risk (OAR) delineation and is inherently resource intensive. Atlas-based automatic segmentation (ABAS) has the potential to facilitate this process and offer the promise to improve efficiency as well as reduce inter- and intraobserver variations in delineated contours. [1, 2] To this end we have evaluated the ABAS capabilities of the MMVISTMA software package - version 5.2 (MMV Software, Cleveland, OH). In this study we attempted to determine the optimal number of subjects needed to achieve high conformity and confidence in the performance of ABAS.
Methods

• Provide an overview of how you conducted your research
• Should be understood by an expert in your field as well as someone with no prior experience
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Methods

Methods

A total of 25 patients who had undergone intensity modulated radiation therapy for various head and neck cancers were retrospectively selected for inclusion in a library to be used for ABAS. The library of 25 patients was then successively pruned, at random, to generate five atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem. These contours were compared to the contours manually delineated by a physician, J.W., who was blinded to the ABAS results. Dico-similarity coefficients (DSC) were calculated and analyzed as a function of atlas size for brainstem and parotid contours. DSC values were calculated as follows:

\[ \text{DSC}(X,Y) = \frac{2 \times \text{Intersection}(X,Y)}{\text{Union}(X,Y)} \]

Where X and Y represent the manual drawn contour and the ABAS generated contour, respectively, and \( \text{Intersection}(X,Y) \) represents the intersection of X and Y. A DSC value of 0 represents no intersection and a value of 1 represents perfect overlap.

Figure 1a and 1b illustrate hand-delineated contours, ABAS generated contours and their manual overlap for the brainstem and parotid sites, respectively.

The strengths of the linear fits were observed to be only weakly correlated with the number of subjects in each atlas. Also, it was observed during patient subset selection that the computer algorithm would often randomly select the same patient as the closest match for contour adaptation. Given that the performance as measured by the Dico-similarity coefficients was minimally sensitive to atlas size, the data suggested that careful selection of a small number of atlas subjects may be of benefit in reducing the time needed to perform ABAS. The data also suggested other methods of improving ABAS performance are warranted to take advantage of a larger number of available subjects in an atlas. One option being investigated in our department is the selection of more than one single subject for contour adaptation with the union of contours generated from the two or more subject atlas matches being expected to improve the overall similarity coefficient values.
Results/Findings

- Highlights what your research shows!
- Include graphs, charts, and images when possible
- Most time spent discussing results/findings during your presentation, expect lots of questions here (is this what you expected to find? etc)
The impact of the number of subjects for atlas-based automatic segmentation

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Abstract

Purpose: To determine the impact of atlas size on the performance of atlas-based automatic segmentation (ABAS) in delineation of organs at risk for adaptive radiation therapy.

Methods: A total of 26 patients who had undergone intensity-modulated radiation therapy for head and neck cancers were retrospectively selected for inclusion in a library to be used for ABAS with the MIM VISTA software package (MIM Software, Cleveland, OH). Treatment planning computed tomography (CT) scans and subsequent organ at risk (OAR) contours generated as part of the treatment planning process for these patients were used to delineate the organs at risk. The library of 26 patients was then successively pruned to generate five atlases with 26, 20, 16, 12, and 5 patients, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for OARs and parotid glands and brainstem contours. 

Results: OAR contours and underlying CT scans for a total of 25 head and neck cancer patients were added to a library to be used for ABAS. The library of 25 patients was then successively pruned, at random, to generate five atlases with 25, 20, 15, 10, and 5 patient subjects, respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate right and left parotid gland and brainstem contours. Those planning CT scans belonged to a unique set of 10 patient subjects different from the ones used for generating the atlases. One physician (JW), who was blinded to the ABAS results, manually delineated gold-standard contours for the right and left parotid glands and brainstem. DICE similarity coefficients were calculated and analyzed as a function of atlas subject size.

Results/Findings

The strengths of the linear fits were observed to be only weakly correlated with the number of subjects in each atlas. Also, it was observed during patient subject selection that the computer algorithm would often repeatedly select the same patient as the best match for contour adaptation. Given that the performance as measured by the similarity coefficients was minimally insensitive to atlas size, the data suggest that careful selection of a small number of atlas subjects may be of benefit in reducing the time needed to perform ABAS. The data also suggest other methods of improving ABAS performance are warranted to take advantage of a larger number of available subjects in an atlas. One option being investigated in our department is the selection of more than a single subject for contour adaptation with the union of contours generated from the top-n subject atlas matches being expected to improve the overall similarity coefficient values.

Conclusions

For the atlas selected in this study, the performance of ABAS was highly insensitive to atlas size. Furthermore, some patient subjects were repeatedly selected implying that the adoption of a single standard patient for ABAS may be of benefit.

References


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Fig. 1

Fig. 2

Fig. 3
Discussion and/or Conclusion

- So what?
- Wraps up your findings
- Provides ideas for future research you might conduct
- The final thought you’re leaving the viewer with
Discussion and/or Conclusion

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Introduction
Increasing sophistication of radiation therapy treatment plans require precise methods of target and organ at risk (OAR) delineation and is inherently resource intensive. Atlas-based automatic segmentation (ABAS) has the potential to facilitate this process and offers the possibility to improve efficiency as well as reduce inter- and intra-observer variations in delineated contours. [1] [2] To this end we have evaluated the ABAS capabilities of the MIM VISTA software package - version 5.2 (MIM Software, Cleveland, OH). In this study we attempted to determine the optimal number of subjects needed to achieve high conformity and confidence in the performance of ABAS.

Fig. 1: A comparison of physician drawn manual contours (red) and those generated by ABAS (yellow). Contour agreement is shown in shaded blue.

Fig. 2: Strength of Dice similarity coefficients as a function of atlas size for brainstem contours. The data were related by \( Y = 0.017X + 0.65 \) (n=40). The average Dice value across the range was approximately 0.69.

Fig. 3: Strength of Dice similarity coefficients as a function of atlas size for parotid gland contours. The data were related by \( Y = 0.017X + 0.65 \) (n=40). The average Dice value across the range was approximately 0.69.

Fig. 4: Brainstem

(1a) Brainstem
(1b) Parotid glands

References

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• References:
  – Any references cited on the poster
  – Use standard citation used in your field
• Acknowledgements (IMPORTANT)
  – Your mentor
  – The program/department sponsoring your research (ex: Research Rookies; Undergraduate Research Apprenticeship Program)
Results/Findings

How Online Social Media and Networks Are Changing Scholarly Practice
Anatoliy Gruzd (gruzu@dal.ca) & Kathleen Staves (kathleenstaves@dal.ca)
School of Information Management, Dalhousie University Social Media Lab, Halifax, Nova Scotia, Canada

Introduction

Scholars are increasingly using online social media (OSM) technologies to communicate, conduct research, and disseminate information about themselves and their work. However, there is very little hard data on if, why, and how scholars are using these new tools.

This poster presents our ongoing research to answer these questions and discover the role that OSM currently play within the scholarly community and its effects on scholars’ careers.

Method

- A comprehensive literature review
- 51 semi-structured interviews with scholars in Library and Information Science
- 36 face to face interviews were conducted during the 2010 ASIS&T Annual Conference, and 13 interviews conducted remotely over the phone

An Interview at the ASIS&T 2010 Conference, Pittsburgh, PA.

Results

Reasons for Use or Non-Use of OSM Tools by Scholars

<table>
<thead>
<tr>
<th>Users</th>
<th>Non-Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>As part of a research project</td>
<td>Time-consuming &amp; information overload</td>
</tr>
<tr>
<td>To stay up to date in their field</td>
<td>Risk of non peer-reviewed information</td>
</tr>
<tr>
<td>Communication and collaboration with colleagues, the public, students, etc.</td>
<td>Concern about loss of intellectual content &amp; privacy</td>
</tr>
<tr>
<td>To create a sense of community for a research group</td>
<td>Colleagues aren’t using OSM, therefore there’s no reason to use it</td>
</tr>
<tr>
<td>More convenient than using print resources for research and communication</td>
<td>Institutional IT departments do not provide enough support</td>
</tr>
<tr>
<td>Great personal information management resources</td>
<td>Concern about sites profiling from users</td>
</tr>
<tr>
<td>To find interesting information outside of their field</td>
<td>Scholars should not have to promote their own work</td>
</tr>
</tbody>
</table>

Although making new connections was not a benefit cited by users, this possibility was examined in an interview question and found to be a common occurrence for scholars using OSM tools.

Many scholars found that scholars, members of the public, and even representatives from the private sector contacted them as a direct result of their presence on, and usage of, OSM.

Common Online Social Media Tools

- Our interviews indicate that currently there is no one single OSM tool that meets the varying needs of the scholarly community.
- Scholars are gravitating toward a wide variety of OSM tools, each satisfying a specific set of needs, whether that be: work flow, collaboration, information dissemination, or research, etc.
- For example, many scholars use Skype to communicate verbally, Google Docs to share data and jointly edit documents and blogs to disseminate their work-in-progress and keep up with colleagues.

OSM & Tenure and Promotion

- None of the scholars interviewed worked for an institution that currently recognizes OSM publications as part of their tenure review and promotion process.
- The majority of interviewees agreed that OSM publications should eventually be considered, as long as there is a way to ensure that they contain relevant peer-reviewed scholarly content.
- Of the respondents who believe that OSM publications should be considered, many felt that it should count toward the service component of the tenure/promotion process.

Conclusions

- Online social media tools are quickly becoming an integral part of scholarly practices.
- Many earlier studies investigating scholars’ use of these tools most often cite the need to communicate with peers as the main reason behind scholars’ use of any social media tool (Barjak, 2006; Bonetta, 2007; Letierse, et al., 2010).
- Our study has shown that there are many more reasons scholars choose to use these tools and that their dependence and usage of OSM tools is increasing.
- With their growing ubiquity and high adoption rate among scholars, it will be interesting to see how the presence and usage of OSM tools will affect the ways scholars disseminate information and research results.

References


Acknowledgements

We would like to thank the many volunteers who agreed to be interviewed for our survey and for the input from the other members of the Dalhousie University Social Media Lab such as Philip Mai, Amanda Wilk and Sophie Coiron. Funding for this project was provided by the Social Sciences and Humanities Research Council (SSHRC) of Canada.

For Further Information

More information on this and related projects can be found at www.SocialMediaLab.ca
Poster “Dos”

1. Use san serif font (e.g. Arial) for Title and Headings
2. Use a plain, solid-color background
3. 30-40% empty space
4. Use charts, images, and graphs in place of words when possible
5. Use high quality images
6. Acknowledge those that helped you
Poster “Don’ts”

1. Use the same font throughout (title, headings, font, table labels, etc)
2. Use fancy background options
3. Forgot to add charts, images, and graphs
4. Be text heavy
5. Use overly technical language
**The Influence of Parent’s Educational Level and Socioeconomic Status on Student’s Educational Level**

**Hiba Issa Asaad**  
Lebanese International University. Educ560

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**Introduction**

A person’s education is closely linked to his/her life chances, income and well-being. Parents and family environment in general, have important impacts on the behavior and decisions taken by adolescents. The study was conducted to determine the influence of parent’s educational level and the family’s socioeconomic status related to the parents’ jobs and monthly income, on their children’s educational level.

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**Methodology**

- Questionnaire consisting of 26 questions was designed.
- Questions focused on three key variables of interest, which are:
  - Student’s academic level.
  - Parent’s educational level.
  - Family socioeconomic status.
- Surveys were distributed among a representative sample of 30 participants who are undergraduate students from two universities and with different majors, ages and genders.

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**Findings**

![Pie chart showing family's monthly income distribution](image1)

**Figure 2.**

**Figure 1. Parental influence on educational achievement of children**

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**Discussion**

From the graphs, it is clear that students who reached the university level have a high socioeconomic status background but different parental educational level. But since the majority of the participants have parents who are educated, this shows that educational background of the family does affect the educational level of students. Also figure 4. shows how students educational levels are affected by SES more than other factors.

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**Conclusion**

The educational level of student is mostly determined by combining parents’ educational level, occupational status and socioeconomic status.

The study shows that:

- Students with high SES background have higher educational levels than those coming from low SES background.
- Parental educational level has no high influence on students’ educational level unless this low educational level was the reason behind the low SES level.

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**References**


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Discovering protein functional sites with unsupervised techniques

Shirley Wu¹, Russ B. Altman²

1 Program in Biomedical Informatics, 2 Department of Bioengineering

Motivation

Characterizing protein function - for example, what molecules they bind and interact with - is important for understanding biological processes. We can use this knowledge to engineer therapeutics and other beneficial biology.

Computational methods are fast and inexpensive, allowing high-throughput prediction of protein function. Most methods are supervised approaches, i.e., they use available data about known proteins and functions to make predictions. Thanks to genomics, researchers are now discovering novel proteins at a tremendous rate. We therefore need methods to identify new functions in proteins as opposed to methods that only recognize known functions.

Methods

We represent microenvironments with vectors of physical and chemical features calculated within a small spherical volume centered on the site of interest. We use k-means clustering to group together millions of such microenvironments computed from protein structures in the Protein Data Bank (PDB).

Evaluation

Results from the subcluster selection approach on the small test set seem reasonable. We then evaluated different distance metrics on a larger test set. Cosine similarity produced subclusters with better purity (external coherence) and silhouette values (internal coherence).

Application

We are currently applying the subcluster selection approach to the whole-PDB k-means clustering. We then use a number of term enrichment methods to gain insight into the possible biological role of the microenvironment represented by each candidate subcluster.

Conclusion

We use unsupervised, automated techniques to identify biologically interesting groups of protein microenvironments, creating a potential pipeline for discovering novel functions.

References

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Abstract

Purpose: To determine the impact of atlas size on the performance of atlas-based automatic segmentation (ABAS) in delineation of organs at risk for adaptive radiation therapy.

Methods: A total of 25 patients who had undergone intensity-modulated radiation therapy for various head and neck cancers were retrospectively selected for inclusion in a library to be used for ABAS with the MIM VISTA software package (MIM Software, Cleveland, OH). Treatment planning computed tomography (CT) scans and subsequent organ at risk (OAR) contours generated as part of the treatment planning process for those patients were added to the library. This library of 25 patients was then sequentially pruned to generate 5 atlases with 25, 20, 15, 10, and 5 patient subjects respectively. Atlas-based segmentation was performed on 10 retrospectively selected planning CT scans to automatically generate contours for the right and left parotid glands and brainstem contours. These planning CT scans belonged to a unique set of 10 patient subjects different from the ones used for generating the atlas. One physician (JW), who was blinded to the ABAS results, manually delineated gold-standard contours for the right and left parotid glands and brainstem. Dice similarity coefficients (DSC) were calculated and analyzed as a function of atlas subject size.

Results: The strengths of the linear fits were obtained to be weakly correlated with the number of subjects in each atlas. Also, it was observed during patient subject selection that the computer algorithm would often repetitively select the same patient as the best match for contour adaptation. Given that the performance as measured by the similarity coefficients was relatively insensitive to atlas size, the data suggest that careful selection of a small number of atlas subjects may be of benefit in reducing the time needed to perform ABAS. The data also suggest other methods of improving ABAS performance are warranted to take advantage of a larger number of available subjects in an atlas. One option being investigated in our department is the selection of more than one subject for contour adaptation with the use of contours generated from the top several subject atlas matches being expected to improve the overall similarity coefficient values.

Conclusion

For the sites selected in this study, the performance of ABAS was fairly insensitive to atlas size. Little to no additional benefit was observed in generating atlases with a greater number of subjects. Furthermore, during ABAS some patient subjects in an atlas were repetitively selected as the closest match, implying that the adoption of a small number of patients for atlas generation may be of benefit when using ABAS for select populations.

Discussions

The strengths of the linear fits were obtained to be weakly correlated with the number of subjects in each atlas. Also, it was observed during patient subject selection that the computer algorithm would often repetitively select the same patient as the best match for contour adaptation. Given that the performance as measured by the similarity coefficients was relatively insensitive to atlas size, the data suggest that careful selection of a small number of atlas subjects may be of benefit in reducing the time needed to perform ABAS. The data also suggest other methods of improving ABAS performance are warranted to take advantage of a larger number of available subjects in an atlas. One option being investigated in our department is the selection of more than one subject for contour adaptation with the use of contours generated from the top several subject atlas matches being expected to improve the overall similarity coefficient values.

References


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Examples

How Online Social Media and Networks Are Changing Scholarly Practice
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Introduction
Scholars are increasingly using online social media (OSM) technologies to communicate, conduct research, and disseminate information about themselves and their work. However, there is very little hard data on if, why, and how scholars are using these new tools.

This poster presents our ongoing research to answer these questions and discover the role that OSM currently play within the scholarly community and its effects on scholars’ careers.

Method
- A comprehensive literature review
- 51 semi-structured interviews with scholars in Library and Information Science
- 38 face-to-face interviews were conducted during the 2010 ASIS&T Annual Conference, and 13 interviews conducted remotely over the phone

An interview at the ASIS&T 2010 Conference, Pittsburgh, PA.

Results
Reasons for Use or Non-Use of OSM Tools by Scholars

<table>
<thead>
<tr>
<th>Reason</th>
<th>Users</th>
<th>Non-Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>As part of a research project</td>
<td>Time consuming &amp; information overload</td>
<td></td>
</tr>
<tr>
<td>To stay up to date in their field</td>
<td>Risk of non-peer reviewed information</td>
<td></td>
</tr>
<tr>
<td>Communication and collaboration with colleagues, the public, students, etc.</td>
<td>Concern about loss of intellectual content &amp; privacy</td>
<td></td>
</tr>
<tr>
<td>To create a sense of community for a research group</td>
<td>Colleagues aren’t using OSM, therefore there’s no reason to use it</td>
<td></td>
</tr>
<tr>
<td>More convenient than using print resources for research and communication</td>
<td>Institutional IT departments do not provide enough support</td>
<td></td>
</tr>
<tr>
<td>Great personal information management resources</td>
<td>Concern about site’s profitability with users</td>
<td></td>
</tr>
<tr>
<td>To find interesting information outside of their field</td>
<td>Scholars should not have to promote their own work</td>
<td></td>
</tr>
</tbody>
</table>

Although making new connections was not a benefit cited by users, this possibility was examined in an interview question and found to be a common occurrence for scholars using OSM tools.

Many scholars found that scholars, members of the public, and even representatives from the private sector contacted them as a direct result of their presence on, and usage of, OSM.

Common Online Social Media Tools

Our interviews indicate that currently there is no one single OSM tool that meets the varying needs of the scholarly community.

Scholars are gravitating toward a wide variety of OSM tools, each satisfying a specific set of needs; whether that be work flow, collaboration, information dissemination, or research, etc.

For example, many scholars used Skype to communicate verbally. Google Docs to share data and jointly edit documents and blogs to disseminate their work-in-progress and keep up with colleagues.

OSM & Tenure and Promotion

None of the scholars interviewed worked for an institution that currently recognizes OSM publications as part of their tenure review and promotion process.

The majority of interviewees agreed that OSM publications should eventually be considered, as long as there is a way to ensure that they contain relevant peer-reviewed scholarly content.

Of the respondents who believe that OSM publications should be considered, many felt that it should count toward the service component of the tenure/promotion process.

Conclusions

- Online social media tools are quickly becoming an integral part of scholarly practices.
- Many earlier studies investigating scholars’ use of these tools most often cite the need to communicate with peers as the main reason behind scholars’ use of any social media tool (Barjak, 2008; Bonetta, 2007; Letierce et al., 2010).
- Our study has shown that there are many more reasons scholars choose to use these tools and that their dependence and usage of OSM tools is increasing.
- With their growing ubiquity and high adoption rate among scholars, it will be interesting to see how the presence and usage of OSM tools will affect the ways scholars disseminate information and research results.

References


Acknowledgements

We would like to thank the many volunteers who agreed to be interviewed for our survey and for the input from the other members of the Dalhousie University Social Media Lab such as Philip Mai, Amanda Wilk and Sophie Doiron. Funding for this project was provided by the Social Sciences and Humanities Research Council (SSHRC) of Canada.

For Further Information

More information on this and related projects can be found at www.SocialMediaLab.ca
Final Thoughts

• Have someone you trust proof read (and tear apart) your poster
• Print a test portion and tape on wall to judge (can copy into word document with same size font)
• The fewer words, the better
• Images, charts, and graphs break up text
• Ask for help (mentor, OSEEL, grad student)
• Have fun!