View Reviews

Paper ID
4682

Paper Title
Identifying Guarantors of War Veterans Using Link Prediction Based on GraphSAGE: A Case of the Korean War

Track Name
AI for Social Impact

Reviewer #1

Questions

1. {Summary} Please summarize the main claims/contributions of the paper in your own words. (Do not provide any review in this box)
The authors propose a combined operations network in which veterans can find guarantors in the network. They train the network on the Korean War data.
The report the improvement in performance over the baseline models.

2. {Scope and promise for social impact} Is this paper likely to have significant social impact?
Likelihood of social impact is high: relatively little effort would be required to put this paper's ideas into practice, at least for a pilot study

3. {Significance of the problem} Are the results significant?
The social impact problem considered by this paper is significant and has not been adequately addressed by the AI community.

4. {Novelty of approach} Are the problems or approaches novel?
Makes a moderate improvement to an existing model, data gathering technique, algorithm, and/or data analysis technique

5. {Justification of approach} Please choose one of the following regarding the justification of approach.
The justification of the approach is convincing overall, but could have been more thorough and/or alternatives could have been considered in more detail

6. {Quality of evaluation} Are claims well-supported by theoretical analysis or experimental results?
Evaluation was convincing: datasets were realistic; analysis was solid

7. {Facilitation of follow-up work} Is the paper well-organized and clearly written?
Weak facilitation of follow-up work: considerable effort would be required to replicate the results or apply them to a new domain

8. {Engagement with literature} Please choose one of the following regarding engagement with literature.
Shows a moderate understanding of other literature on the topic, but does not engage in depth

9. {Reasons to Accept} Please describe the paper's key strengths.
This paper definitely contributes to the society by potentially helping war veterans obtain their benefits even in the absence of their service record.

10. {Reasons to Reject} Please describe the paper's key weaknesses.
N/A

11. {Detailed Comments} Please elaborate on your assessments and provide constructive feedback.
N/A

12. {QUESTIONS FOR THE AUTHORS} Please provide questions for authors to address during the author feedback period. (Please number them)
N/A

14. (OVERALL SCORE)

7 - Accept

19. I acknowledge that I have read the author's rebuttal and made whatever changes to my review where necessary.
Agreement accepted

Reviewer #2

Questions

1. {Summary} Please summarize the main claims/contributions of the paper in your own words. (Do not provide any review in this box)
This work formulates the task of identifying the guarantors of war veterans as a link prediction task. It then uses a GraphSAGE based model to solve the formulated problem. Experimental results show the proposed method is effective. The main contribution of this work lies in the significance of the studied problem, the formulation of the task, and the use of advanced deep learning models to solve it.

2. {Scope and promise for social impact} Is this paper likely to have significant social impact?
Likelihood of social impact is high: relatively little effort would be required to put this paper's ideas into practice, at least for a pilot study

3. {Significance of the problem} Are the results significant?
The social impact problem considered by this paper is significant and has not been adequately addressed by the AI community.

4. {Novelty of approach} Are the problems or approaches novel?
This paper's contribution was elsewhere: it employs existing models, data gathering techniques, algorithms, and/or data analysis technique (e.g., the paper presents a new experimental design and evaluation procedure).

5. {Justification of approach} Please choose one of the following regarding the justification of approach.
The justification of the approach is relatively convincing, but has weaknesses

6. {Quality of evaluation} Are claims well-supported by theoretical analysis or experimental results?
Evaluation was adequate, but had significant flaws: datasets were unrealistic and/or analysis was insufficient

7. {Facilitation of follow-up work} Is the paper well-organized and clearly written?
Adequate facilitation of follow-up work: moderate effort would be required to replicate the results or apply them to a new domain

8. {Engagement with literature} Please choose one of the following regarding engagement with literature.
Shows a moderate understanding of other literature on the topic, but does not engage in depth

9. {Reasons to Accept} Please describe the paper's key strengths.
1. The studied problem is very important to AI applications.
2. It formulated the problem as a well-studied task in AI and then leveraged the advanced models to solve it.
3. It has the potential to contribute to the field by making the collected data publicly available (under constraints).

10. {Reasons to Reject} Please describe the paper's key weaknesses.
1. The technical contribution is very limited.
2. The experiments are not convincing.
3. The writing can be significantly improved.

11. {Detailed Comments} Please elaborate on your assessments and provide constructive feedback.
I like and appreciate the application this paper has been trying to study as its social impact is significant. However, I would have higher confidence in this paper if the experimental results were more convincing and the writing was significantly improved. For the baselines, for example, they are very old methods. there are stronger baselines such as models in network embedding. Moreover, there are more advanced GNN models than GraphSAGE developed in recent two years, why not use those instead?

While the direct application of GNN models to the task can still be considered as contribution in the field, these

models could be better used if they were adapted to addressing the unique challenges in the task. Also, I had difficulty understanding the paper as it is not well organized and the content could be largely improved. For example, the GNN literature is not sufficient. The baselines can be better illustrated and the figures can be created with higher resolution (they are hard to read currently). Many descriptions are too brief to be understood, e.g., the description of GraphSAGE and analysis of the results.

Comments after Author Response
Thanks for the answers.

12. {QUESTIONS FOR THE AUTHORS} Please provide questions for authors to address during the author feedback period. (Please number them)
1. Why use GraphSAGE but not more advanced GNN models?
2. I do not see test set. Is the validation set same as the test set?
3. What's the reason to use the selected baselines?

14. (OVERALL SCORE)
5 - Below threshold of acceptance

19. I acknowledge that I have read the author's rebuttal and made whatever changes to my review where necessary.
Agreement accepted

Reviewer #3

Questions

1. {Summary} Please summarize the main claims/contributions of the paper in your own words. (Do not provide any review in this box)
- This paper proposes a method for supporting veterans who participated in war but cannot receive adequate social supports.
- The proposed method is using link prediction for finding candidates of guarantors of war veterans.
- Using a Korean War dataset, the effectiveness of the proposal is evaluated.

2. {Scope and promise for social impact} Is this paper likely to have significant social impact?
Likelihood of social impact is moderate: this paper gets us closer to its goal, but considerably more work would be required before the paper's ideas could be implemented in practice

3. {Significance of the problem} Are the results significant?
The social impact problem considered by this paper has some significance and this paper represents a new take on the problem

4. {Novelty of approach} Are the problems or approaches novel?
Makes a moderate improvement to an existing model, data gathering technique, algorithm, and/or data analysis technique

5. {Justification of approach} Please choose one of the following regarding the justification of approach.
The justification of the approach is relatively convincing, but has weaknesses

6. {Quality of evaluation} Are claims well-supported by theoretical analysis or experimental results?
Evaluation was adequate, but had significant flaws: datasets were unrealistic and/or analysis was insufficient

7. {Facilitation of follow-up work} Is the paper well-organized and clearly written?
Adequate facilitation of follow-up work: moderate effort would be required to replicate the results or apply them to a new domain

8. {Engagement with literature} Please choose one of the following regarding engagement with literature.
Shows a moderate understanding of other literature on the topic, but does not engage in depth

9. {Reasons to Accept} Please describe the paper's key strengths.

- The problem addressed in this paper is important in our society.
- The problem setting and the dataset in this paper are unique in the social network research community.

10. {Reasons to Reject} Please describe the paper's key weaknesses.
- The proposed approach is applying existing link prediction techniques to the war dataset. The methodological contributions are weak.
- There are some unclear points in experimental settings, and the validity of the experiments is unclear.

11. {Detailed Comments} Please elaborate on your assessments and provide constructive feedback.
Supporting veterans who participated in War but cannot receive adequate social supports is important. Using social network analysis in the domain of War data is novel, which may open a new research field.

While the studied problem is important and interesting, the methodological contributions of this paper seem to be weak. Using GraphSAGE for link prediction is not new. Although applying GraphSAGE to the War dataset is new, the difficulties when applying GraphSAGE to the dataset in this paper are unclear.

I also have some concerns in experimental evaluation. The proposed method is expected to be used for incomplete war records. In the experimental evaluation, the test data are randomly selected positive and negative edges. The error patterns in incomplete war records may not be random. Therefore, the practical effectiveness of the proposed method is unclear.

The validity of using a balanced dataset for evaluation is also unclear.
In the link prediction, there are a small number of positive links whereas there are many negative links. It is OK to use a balanced dataset for training, but using a balanced dataset for test makes it difficult to understand the practical effectiveness of the methods because real datasets are quite imbalanced.

12. {QUESTIONS FOR THE AUTHORS} Please provide questions for authors to address during the author feedback period. (Please number them)
1. Hyper-parameters tuning.
Data used for hyper-parameter tuning are not specified. Does the grid search conducted on the training data? If the 10\% test data is used for parameter tuning, it is unfair.

2. Baseline methods.

AA, RA, CN, and JC are unsupervised link prediction methods. Therefore it is necessary to determine the threshold values when computing precision and recall. How did the authors determine the threshold values for the unsupervised methods?

14. (OVERALL SCORE)
5 - Below threshold of acceptance

19. I acknowledge that I have read the author's rebuttal and made whatever changes to my review where necessary.
Agreement accepted

Reviewer #4

Questions

1. {Summary} Please summarize the main claims/contributions of the paper in your own words. (Do not provide any review in this box)
The paper proposes a link recommendation method for networks of war Veterans to be used in order to suggest veterans who participated in a same battle. This is useful as "buddy statement" are needed in order to receive various benefits when official documents are lost.

The approach consists in using a known method called GraphSAGE to compute link recommendations. The experiments, based on data from Korean War, show that GraphSAGE outperforms other methods.

2. {Scope and promise for social impact} Is this paper likely to have significant social impact?

Likelihood of social impact is high: relatively little effort would be required to put this paper's ideas into practice, at least for a pilot study

3. {Significance of the problem} Are the results significant?

This paper's contribution was elsewhere: it follows up on an existing problem formulation or introduces a new problem with limited immediate potential for social impact

4. {Novelty of approach} Are the problems or approaches novel?

This paper's contribution was elsewhere: it employs existing models, data gathering techniques, algorithms, and/or data analysis technique (e.g., the paper presents a new experimental design and evaluation procedure).

5. {Justification of approach} Please choose one of the following regarding the justification of approach.

The justification of the approach is convincing overall, but could have been more thorough and/or alternatives could have been considered in more detail

6. {Quality of evaluation} Are claims well-supported by theoretical analysis or experimental results?

Evaluation was adequate, but had significant flaws: datasets were unrealistic and/or analysis was insufficient

7. {Facilitation of follow-up work} Is the paper well-organized and clearly written?

Weak facilitation of follow-up work: considerable effort would be required to replicate the results or apply them to a new domain

8. {Engagement with literature} Please choose one of the following regarding engagement with literature.

Does not engage sufficiently with other literature on the topic

9. {Reasons to Accept} Please describe the paper's key strengths.

I think the topic is somehow important and has a social impact since the system can be actually be used by veterans in real world.

10. {Reasons to Reject} Please describe the paper's key weaknesses.

The paper applies a known methodology for link recommendation to a specific network, it does not introduce new methods that can be applied to a wider context. Moreover, such methods are applied to a single dataset (Korean War). The results are not general enough.

In my opinion the topic is too narrow and it is not suitable for a conference like AAAI. I think that the paper deserves publication but maybe to a more specialized or applied venue.

11. {Detailed Comments} Please elaborate on your assessments and provide constructive feedback.

The writing should be improved. There are missing parts and part that can be simply removed, I list some of them in the following.

Figure 1 is not described and it is not clear what is supposed to show or illustrate.

The first two paragraphs of "Related Works -- Veteran affairs" are not relevant for this work.

It is not clear if subsection on Neural network of related work contains all the relevant work on the topic.

Figure 3 and 4 illustrate the same concept, you should present only one of them. Moreover, Figure 4 appears before Figure 3.

It is not clear why you show a visualization of the bipartite graph in Figure 5. What is the informative value of this figure? Please remove.

Page 1, line 47. "Each country acknowledges the participation in wars in the following manner." What manner? The text that follows discusses about the fact that in 1973 some material was lost.

12. {QUESTIONS FOR THE AUTHORS} Please provide questions for authors to address during the author feedback period. (Please number them)

Do you think that there are other applications/scenarios that can benefit from your research (besides the one on war veteran)?

14. (OVERALL SCORE)
5 - Below threshold of acceptance

19. I acknowledge that I have read the author's rebuttal and made whatever changes to my review where necessary.
Agreement accepted

Reviewer #5

Questions

1. {Summary} Please summarize the main claims/contributions of the paper in your own words. (Do not provide any review in this box)
The paper applies Graph Neural Networks to help veterans finding guarantors. Multiple GNN method is tried on the Korea War dataset.

2. {Scope and promise for social impact} Is this paper likely to have significant social impact?
Likelihood of social impact is moderate: this paper gets us closer to its goal, but considerably more work would be required before the paper's ideas could be implemented in practice

3. {Significance of the problem} Are the results significant?
The social impact problem considered by this paper has some significance and this paper represents a new take on the problem

4. {Novelty of approach} Are the problems or approaches novel?
This paper's contribution was elsewhere: it employs existing models, data gathering techniques, algorithms, and/or data analysis technique (e.g., the paper presents a new experimental design and evaluation procedure).

5. {Justification of approach} Please choose one of the following regarding the justification of approach.
The justification of the approach is relatively convincing, but has weaknesses

6. {Quality of evaluation} Are claims well-supported by theoretical analysis or experimental results?
Evaluation was convincing: datasets were realistic; analysis was solid

7. {Facilitation of follow-up work} Is the paper well-organized and clearly written?
Adequate facilitation of follow-up work: moderate effort would be required to replicate the results or apply them to a new domain

8. {Engagement with literature} Please choose one of the following regarding engagement with literature.
Shows a moderate understanding of other literature on the topic, but does not engage in depth

9. {Reasons to Accept} Please describe the paper's key strengths.
The paper applies link prediciton model to a important and potentially impactfull problem guarantor identifying.

10. {Reasons to Reject} Please describe the paper's key weaknesses.
1. The paper does not clearly present the method details. For example, the network has two type of the nodes, unit nodes and operation nodes. But I am not sure what is the exact feature used when doing the link prediction.

2. The visualization of paper is less informative. For example, figure 5, I do not get the point of showing this figure. Again, for table 1, I do not get any information of seeing this adjacency matrix in such a short version.

11. {Detailed Comments} Please elaborate on your assessments and provide constructive feedback.
Please see box 10.

12. {QUESTIONS FOR THE AUTHORS} Please provide questions for authors to address during the author feedback period. (Please number them)
Please see box 10.

14. (OVERALL SCORE)
5 - Below threshold of acceptance

19. I acknowledge that I have read the author's rebuttal and made whatever changes to my review where necessary.

Agreement accepted