Exact App: An Experience Network

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Abstract

This network offers a way to verify a user's experiences while preserving privacy, requiring no sensitive personal information.

1 Introduction

Current online systems are often manipulated by fake accounts. These accounts create fake interactions, such as comments or likes, which influence recommendation systems and people's decisions. On Amazon, fake transactions and reviews can mislead users' buying choices. Fake news is published to attract online traffic. On LinkedIn or dating apps, fake accounts are used to scam people. The reason this happens is that spreading fake information is low-cost. When a fake account is caught, it is usually just blocked, which is a small consequence compared to the harm caused.

Current solutions to detect fake accounts include user reports and algorithmic detection. However, user reports are often ineffective because the damage is usually done before a report is made, and many users either don't bother to report fake content or fail to recognize it as fake. Algorithmic detection, on the other hand, is not always reliable and can sometimes miss or misidentify fake content.

I create a plantform where each account is linked to a real person using minimal sensitive personal information. This ensures that spreading fake information has real consequences, discouraging dishonest behavior. Current real-identity social networks, such as Facebook and LinkedIn, allow users to provide any information they choose, making it difficult to distinguish real accounts from fake ones. On the other hand, platforms like the early stages of Facebook or Google Scholar require users to verify their identity through a company or school email. However, this approach risks privacy leaks, and the email becomes inaccessible if the user leaves the organization.

I propose a new type of social network that focuses on connecting people's experiences rather than directly connecting people. In this "experience network," each node represents an experience, such as studying at a university. Connections, or edges, are formed when experiences are shared—for example, if two individuals were schoolmates, they could link their educational experiences. Using this network, the platform can assign a score to each experience based on the number of nodes within the network it belongs to. A user's identity is then

represented as a collection of their experiences. This approach requires no more information than platforms like LinkedIn, but it gives users greater confidence when viewing a stranger's profile and their experiences. With this additional information, I hope users can make better judgments about a stranger's posts, comments, and other interactions. Moreover, this system can help detect fake accounts, as such accounts are composed of fake experiences that are typically linked to other fake experiences and fake accounts.

2 Experience Network

2.1 Node

An individual's experience is represented as a node in the network. Each experience is defined by its start time, end time, and a description. For study and work experiences, an associated organization, such as an institution or company, can also be included as optional information.

2.2 Edge

When two people share experiences, their respective nodes can be connected in the network. But what does it mean to "share" an experience? The system considers experiences to be shared if they are the same but come from different individuals.

For example, two schoolmates share an educational experience at the same school. A group of people who enjoy a meal together share the same dining experience. Similarly, two soldiers who serve in the same military unit share the same service experience. Although these experiences belong to different people, they are fundamentally the same, allowing their nodes to be connected in the network.

2.3 Experience Network

2.3.1 Network Build

Users can upload their experiences as nodes in the network and request to link their experiences with others based on their selection. Once the other user accepts the request, an edge is formed. These edges are essential to the network's structure, connecting similar experiences to form subnetworks. These subnetworks serve as key data for calculating experience confidence scores, detecting fake experiences, and building recommendation systems. Ideally, users should send and accept link requests thoughtfully, as the system relies on them to help distinguish real experience subnetworks from fake ones.

2.3.2 Sparsity

Each subnetwork can be a sparse network, meaning not every experience needs to connect to as many others as possible. As long as connections extend beyond

small, isolated groups, the subnetwork can grow rapidly. In practice, this means users only need to connect their experiences with a few close friends who share the same experiences. Even with these limited connections, a sparse network can still cover a large population effectively.

2.3.3 Upper Bound

The upper limit of nodes in each subnetwork is defined by the number of people who share the same experience. For example, the maximum number of nodes in an undergraduate learning experience subnetwork corresponds to the total number of students at that school. Similarly, the upper limit for a conference-attending experience subnetwork is the total number of attendees at the conference.

2.4 Experience Network v.s. User Network

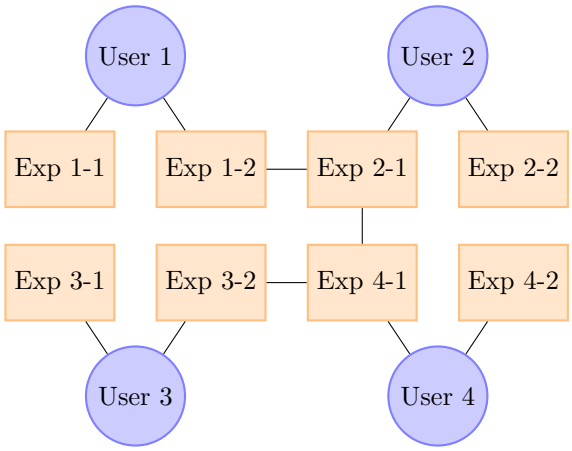
2.4.1 Isolated Subnetworks

The Experience Network consists of many isolated yet internally connected subnetworks. In contrast, a User Network often forms a single, large connected network. The advantage of isolated subnetworks is that they naturally group people by their shared experiences, creating organic and meaningful groups that are difficult to achieve in traditional user networks.

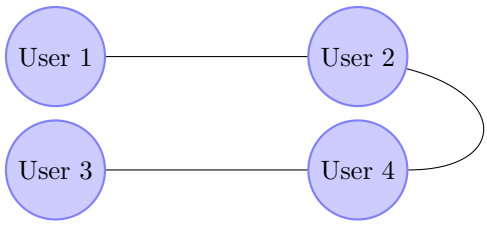
2.4.2 Connection Reliability

Connections based on shared experiences are more reliable than typical user connections, such as follows or friend requests. For example, a connection on LinkedIn doesn't necessarily indicate familiarity between two users. While some connections may come from schoolmates or colleagues, they are often indistinguishable from random connection requests, making the reliability of such links questionable.

Experience Network



User Network



3 ID System Design on Experience Network

Each user in the system is represented by a collection of their experiences, aligning with the philosophy that a person is defined by their experiences. Sharing experiences in this way does not violate privacy, as people often share their experiences on other social networks or in their daily lives.

3.1 Experience Defination

Experience is an abstract concept, but in the first version of this system, it focuses on two key types: educational experience and work experience. The essential details for each experience include the start and end time, the associated organization, and the role. To support this, the system also maintains an information list of organizations.

3.2 Experience Connection

When two users want to connect their experiences, the system enforces specific conditions to ensure accuracy. First, the experiences must be of the same type, such as educational experiences. Second, they must be associated with the same organization. Lastly, the time periods of the experiences must overlap. Once a connection is established, it cannot be undone unless the associated experience is deleted, in which case all related connections are also removed. Since connections are a vital part of the system, these conditions are strictly enforced to preserve the network's integrity.

3.3 Experience Confidence Score

For each educational or work experience, the system assigns a confidence score. Let N represent the number of nodes in the subnetwork to which the experience belongs. The confidence score is calculated as:

$$\text{Confidence Score} = \frac{\min(|N|, 50)}{50}$$

This normalization aims to balance the differences between large and small organizations. I design Algorithm 1 to efficiently determine $|N|$, the size of the subnetwork. The `union` function is called whenever an experience connection is made, while the `find` function is periodically called to retrieve the updated $|N|$.

3.4 Fake Experience Detection

As the system gains a large user base, users can evaluate an experience by checking its confidence score and its directly connected experiences. They can also review the associated accounts, enabling them to assess the authenticity of a stranger's experience.

If a fake account creates a fake experience, it would need to create multiple other accounts to boost the confidence score of that experience. Additionally, these accounts would need diverse, believable experiences to make it looks normal. If any of these accounts is reported and the network's links remain unpolluted—meaning real experiences are not connected to fake ones—the system can quickly identify and isolate all fake accounts through the linked experience network.

3.5 Alias with Experience

Users may wish to post or provide feedback anonymously. However, in some cases, such as sharing professional insights, they may want to add credibility to their feedback using an alias. To support this, the system allows users to link their aliases to their experiences. For example, an alias like "Former XX School Student" can be used to provide feedback about their school or professors, adding context and reliability while maintaining a level of anonymity.

Input: Each experience has its own `id`, `root id`, and `size`, where `size` represents $|N|$. The `root id` and `size` are initialized to the experience's `id` and 1, respectively.

```
Function find(experience):
    if experience.root.id == experience.id then
        return experience;
    else
        experience.root.id = find(experience.root);
        experience.size = experience.root.size;
        return experience.root;
    end
Function union(experience1, experience2):
    root1 = find(experience1);
    root2 = find(experience2);
    if root1.id != root2.id then
        if root1.size > root2.size then
            root1.size += root2.size;
            root2.root = root1;
        else
            root2.size += root1.size;
            root1.root = root2;
        end
    end
```

Algorithm 1: Union-Find Algorithm for Experience Network

4 Summary and Outlook

This system offers a way to provide confidence when interacting with unfamiliar accounts without requiring private information, such as a company email. The goal is for this system to serve as a backbone for various applications, including online dating, shopping, and social media. These applications can share the experience-linked ID system to deliver more reliable and less biased services.