

# Relative Finder

*Socially Incentivizing Genealogy*

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## Introduction

Genealogy is something that is hard to get into. People interested in starting either have a lot of the family tree filled out (long time Ids members) or have no clue where to start. Historically, the dominant demographic of Ancestry.com was female, white older than 55.

## Abstract

RelativeFinder.org (Relative Finder or RF) is a website that allows one to find relatives, both among friends and pre-selected famous people. It has been around for a while, but has been going through a redesign to expand its capabilities and position it for permanent growth. It aims to appeal to the younger and more connected generation.

Relative Finder is squarely aimed at the demographic of people that already have data in FamilySearch.org with a login.

Although genealogy involves human interaction, it is more of a solitary endeavor rather than social. There's a high barrier to entry: people's perception. RF aims to incentivize family history by turning it into a social endeavor with a well-known, easy point of entry. It turns something that may for some be merely an academic exercise into something that sparks conversations among friends and family.

RF takes a two pronged approach to this. It offers genuine, but often short lived novelty and use. Finding relatives can be very interesting - using social media and social circles, it attracts first time users. In addition, it provides advanced tools that encourage long term investment in family history. RF provides tools for establish genealogy as a social activity and long term incentives for establishing one's genealogical record.

## History and Development

Relative Finder has been around for a few years now. At recent update in 2011 introduced a facebook app that utilized the relative finder backend. It ran using an assortment of PHP files and relied on joint data from familysearch.org and the ancestral file. The look was sparse and modification was hard.

With an infusion of new programmers, the lab decided to update RF. It moved to a Python/MongoDB backend. An optimized algorithm designed to run in linear time was written to

reduce query time. In addition, RF's public face has now been modernized. The site now requires the use of javascript, opening several avenues of visualization previously unavailable.

The redesign allows RF to work across multiple targets: phone, tablet and desktop. It's taken some major steps, such as figuring out a mobile friendly tabular data format (see Figure 1). But we believe that it will provide a major advantage since people often discover sites on mobile, but only later move to tablet or desktop.

## Related Work

There are roughly four types of relative finding services that exist currently:

- 2) Finding relatives through genetic tests. (23andMe)
- 3) Finding relatives from the dead using your family tree. (FamilySearch.org API)
- 4) Finding relative you know the names of. (peoplesmart)

Relative Finder introduces a new category - discovering relationships with friend through family tree data. The other categories all are geared towards finding strangers or dead people. All

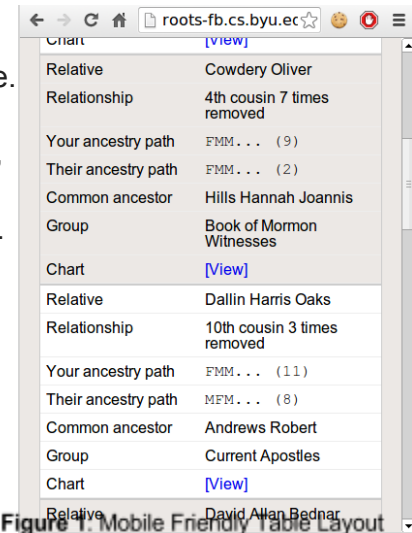
## How Relative Finder Works

Relative Finder works by comparing two family trees to search for a common ancestor. Using the ahnentafel numbers, we have an algorithm that can find relatives in  $O(n)$  time, where  $n$  is the number of ancestors in the tree.

It obtains and caches the target tree data from FamilySearch.org. It has two ways of doing this. The first is to download the tree of a dead person - this is easy and requires no user intervention. The other it to have a user authenticate with FamilySearch.org allowing RF to access and download the family tree. This is necessary because of the restrictions FamilySearch.org puts on the data people still living.

## Ways to find

Finding relatives is RF's main selling point. In order to provide a good user experience, RF uses three main ways of batching search to allow people to find relatives - built in groups, user defined groups and via a list of facebook friends. These methods all have different types of appeal and contribute to user becoming an active, long-term users of the site.



The screenshot shows a browser window with the URL 'roots-fb.cs.byu.ec'. The page displays a table with two sections of results. Each section starts with a 'Chart' link and a 'Relative' name. The first section lists 'Cowdery Oliver' as a 4th cousin 7 times removed, with ancestry paths of FMM... (9) and FMM... (2), and a common ancestor 'Hills Hannah Joannis' from the 'Book of Mormon Witnesses' group. The second section lists 'Dallin Harris Oaks' as a 10th cousin 3 times removed, with ancestry paths of FMM... (11) and MFM... (8), and a common ancestor 'Andrews Robert' from the 'Current Apostles' group. A third section is partially visible at the bottom, showing 'David Alan Bednar' as a relative.

Chart	<a href="#">[view]</a>
Relative	Cowdery Oliver
Relationship	4th cousin 7 times removed
Your ancestry path	FMM... (9)
Their ancestry path	FMM... (2)
Common ancestor	Hills Hannah Joannis
Group	Book of Mormon Witnesses
Chart	<a href="#">[View]</a>
Relative	Dallin Harris Oaks
Relationship	10th cousin 3 times removed
Your ancestry path	FMM... (11)
Their ancestry path	MFM... (8)
Common ancestor	Andrews Robert
Group	Current Apostles
Chart	<a href="#">[View]</a>
Relative	David Alan Bednar

Figure 1. Mobile Friendly Table Layout

The screenshot shows a search interface for 'Relative Finder'. At the top, there is a search input field containing the letter 'e', a 'Check All' button, and a 'Show Relatives' button. Below the search bar, the interface is divided into two sections: 'Groups you're in:' and 'Built in groups:'. Under 'Groups you're in:', there is a single checkbox labeled 'Relative Finder Team'. Under 'Built in groups:', there is a list of 25 checkboxes, each corresponding to a different group: Book of Mormon Witnesses, Current Apostles, Declaration Signers, Early Apostles, Early LDS, Eight Witnesses, European Royalty, Famous Americans, Famous Europeans, Famous Writers, Hodgett Wagon, LDS Pioneers, Mayflower, Military Explorers, Past Seventies, Prophets, Prophets Wives, Reformers, Rescuers, Science Technology, Seventy, Three Witnesses, U.S. Presidents, and Willie Handcart.

**Figure 2:** Finding relative from groups

RF is pre-populated with the informations of groups of famous peoples - these are the built in groups. It is the first milestone users will hit - finding famous relatives. It requires no effort to their own in order to start using them. It provides the hook that will interest users before making it a social experience. At the same time, it provides a hook that can draw others in. In addition, with the users' ability to create groups, we anticipate being able to curate interesting user-made groups and convert them into built-in groups to provide to the public.

The second type of group, user defined groups, provide the next leg of involvement. Here the users will be able to make their own groups to reflect their social circles. It provides a means to promote RF and foster discussion within the context of their social circles. Given the shifting nature of social groups amongst younger people (20-30 years old), this should become a process that draws people back several times.

Facebook friends is the last simple method of finding relatives. This will get users to return to our site. Since it only works with whatever friends are also using Relative Finder, users will want to return multiple times as more and more of their friends register with it. People are eager to post novel things on facebook, and this provides an easy way to do so. We expect this method to provide the kick to make RF popular.

## Novel Ways to Incentivize

The previously mentioned ways to find all existed on the previous version of Relative Finder - they are good, but they don't hold a lot of lasting power. On their own they are novelties that would wear off. Relationships between people don't change, and adding to your family tree is a big enough task that users need a large incentive for it to be effective.

Stronger incentives are needed to retain users of RF. They can either be rewards for having done family history or better tools to do family history with.

The ability to find out direct descendancy will be a major incentive. Relative Finder provides an easy batched method to find out if someone is a descendant of a group of people. It could be for a genetic disease, scholarship information or other yet unforeseen groups.

Visualization gives a couple of strong tool for socializing family history - they let you easily discover people to work with while giving you an interesting view of your data. RF will initially

focus on the networking aspect of visualizations. The visualizations RF uses are already found in other fields or are simple tweaks to current visualization methods for family history.

RF will use a visual adjacency matrix to help visualize group patterns. It's not quite done yet. Right now, RF populates a matrix based of the strength of the relationship between two people and uses MCL (Markov Chaining Algorithm) to find clusters. With visualizations utilizing coloring coding clusters, shading, and interactive sorting, it's possible to visually find large groups of highly connected people. While these people might not be all related through the same ancestor or line of their own tree, all the people would have something to talk about in each others presence. This makes it a potential tool to find groups of people to work with family history on.

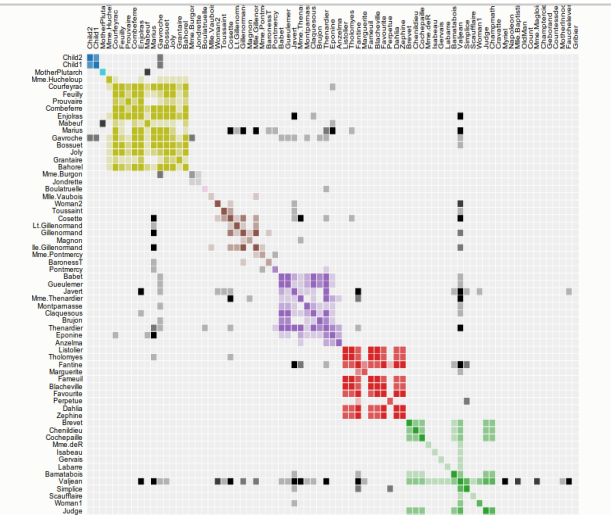


Figure 3: An example visualization of relationships (characters from Les Miserables)

RF utilizes a fan chart to visualize patterns on an individual's family tree. From a group report we extract the ahnentafel number of each common ancestor and use that to populate a single fan chart. Using d3.js we have made the fan chart navigable and interactive. Additionally, each cell in the fan chart displays the number of relatives that that ancestor links you to, giving you their name. In this way, it is trivially easy to focus in on a part of your family tree and search for potential collaborators among people you know.

### Future Work

More visualizations such as a chorded graph chart could be added. We foresee having to make a custom canvas library to support easy, performant javascript visualization. In addition, we are going to add options to make groups that don't need to be joined in order to find relatives among them as well as descendancy only groups. Additionally, using the information about common ancestors, it might be possible to relative finder into a social genealogical portal.

### Conclusion

RF is now poised to become a popular genealogical site. It is set up to cater to a much untapped demographic of younger people. It is mobile and tablet friendly. It provides easy hooks though simple methods to find relatives from existing social circles. It will be easy to use via facebook. Most importantly, it provides long term incentives for users to return. It makes genealogy a social activity.