# Forensic Engineering Science: Developing Tools for Human Identification

## Motivation

- The identification of humans is a major forensics problem as many deceased people are found with no name due to various circumstances.

- The use of visual depictions of geographical data has been regarded as a vastly superior medium for analysing genealogical history.

- The project was motivated by an industry need for a simple, self-contained program capable of displaying the relevant geographic data associated with persons listed in a given GEDCOM file as no such programs currently exist, and is a time-consuming process to do it manually.

## Aim and scope

- Produce a user-friendly program capable of taking in a GEDCOM file and producing an interactive map displaying the locations and information of each individual listed in the GEDCOM file.

## Objectives

1. Develop GEDCOM to Comma-Separated Values(CSV) file Parser
2. Integrate the GEDCOM parser and get Coordinates from the location
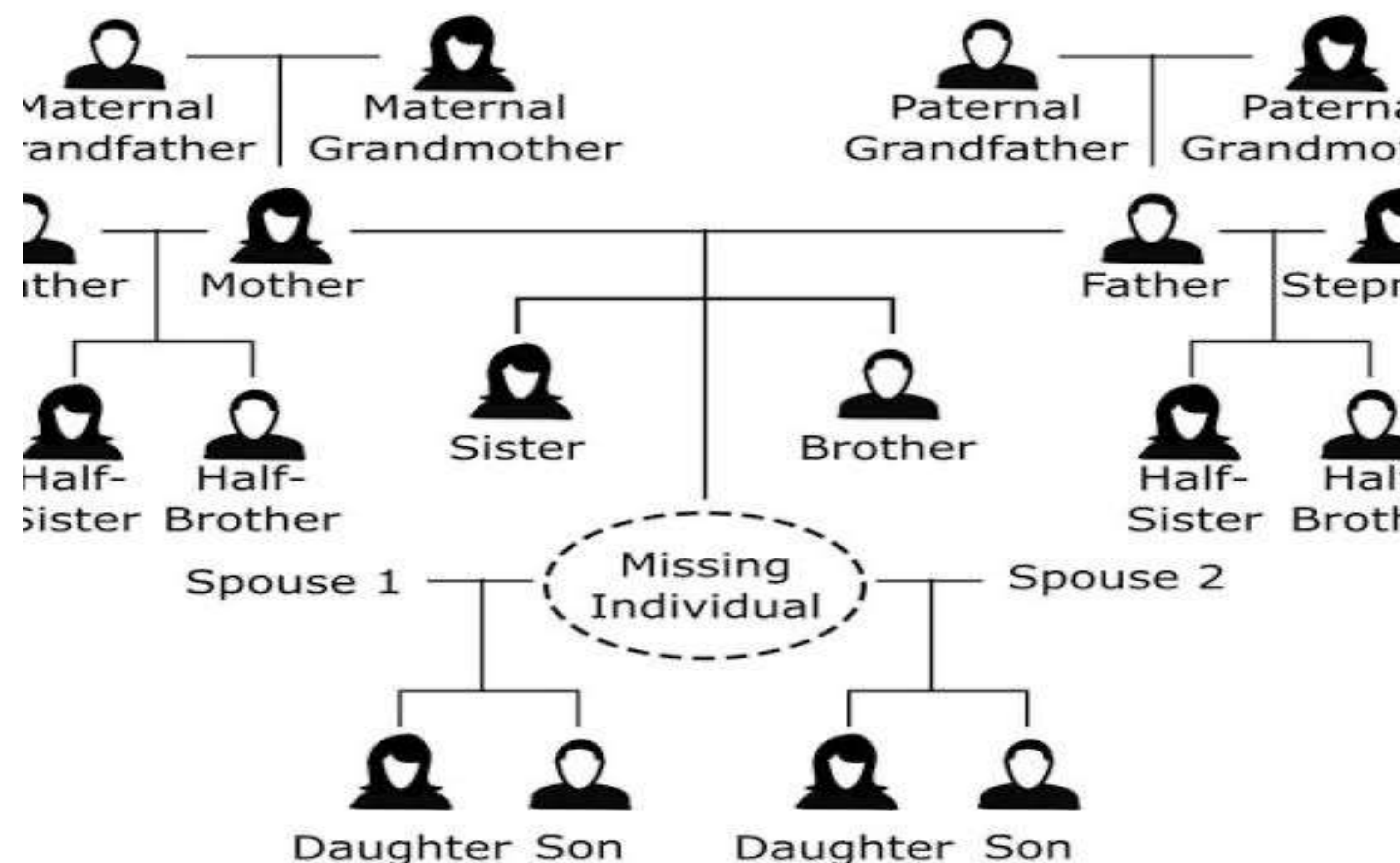3. Develop Conversion to Keyhole Markup Language(KML)
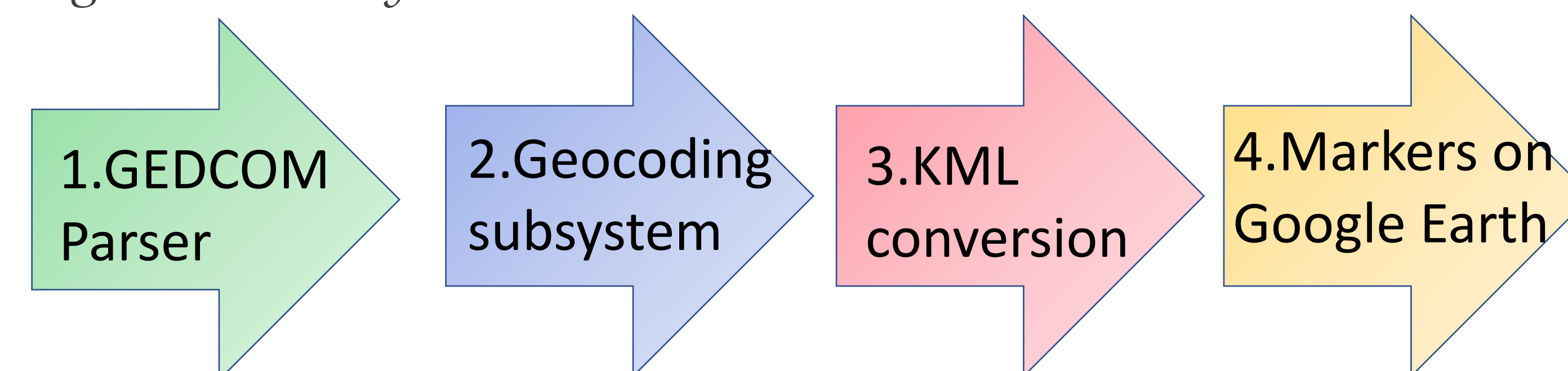4. Display in Google Earth



*Figure 1-Family tree*

1. GEDCOM Parser → 2. Geocoding subsystem → 3. KML conversion → 4. Markers on Google Earth



*Figure 2- The Google Earth based display for tracking family trees*

## Method

- The project was successful and has vastly reduced the time required to create visual maps of genealogical information.

**Subsystem 1:**

- Parser to convert from GEDCOM to .CSV file format as .CSV is much cleaner. Written from scratch in Python.

**Subsystem 2:**

- Geocoding subsystem to convert location names such as Adelaide, South Australia to co-ordinates for future mapping. Done in Python using the Google Geocoding API. 20,000 calls can be made monthly for free using this API. Beyond that it becomes $5 per 1000 calls.

**Subsystem 3:**

- Utilizes a commercially available program, Earthpoint, to create .KML files from .CSV files. These .KML files are customized to display individual's birth and death locations on a Google Earth style map.

## Outcomes

- The project was successful and has vastly reduced the time required to create visual maps of genealogical information.

- Previously five separate programs and manual editing of files was required for project collaborator Colleen Fitzpatrick to create a map, and this has been reduced to a single program with an intuitive user interface.

- The project will be made available to all in the field for a small price to cover the cost of the Google Geocoding API.

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