Statement of Qualifications

Decision Tree, LLC

Software | Machine Learning | Paleoenvironmental Reconstruction

Decision Tree, LLC

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To the Reader

This document provides a general overview to the qualifications and experience of Decision Tree, LLC. Decision Tree, LLC offers a wide variety of analytical services ranging from machine learning to custom software development. We believe that data is the key to opening doors, and that advanced analytics is integral to shaping the future. We welcome the opportunity to discuss your project plans.

Included here is an abbreviated listing of our services and the types of projects they can be implemented on.

You can reach us at

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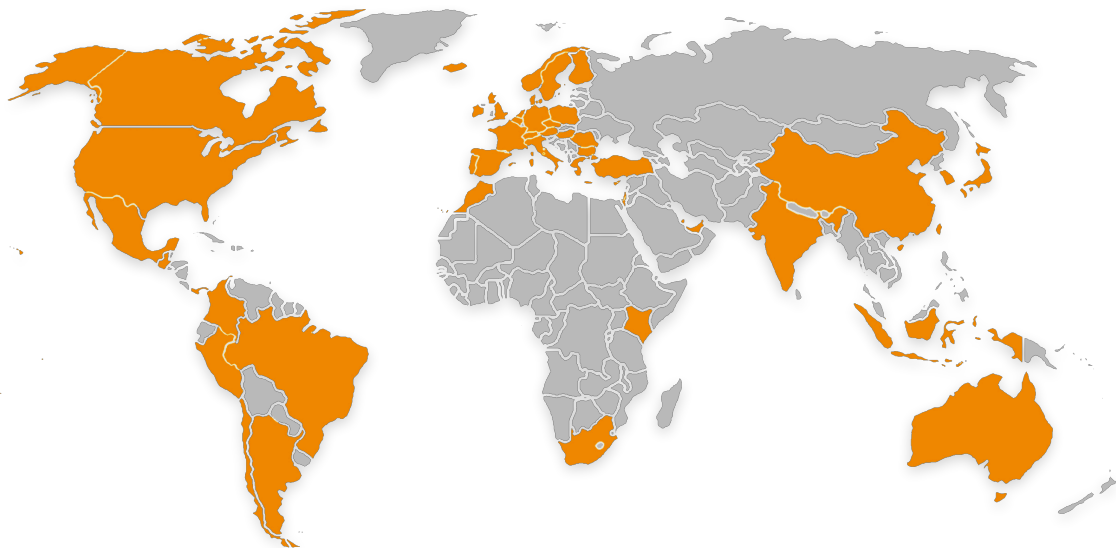email: lee@decisiontreellc.com

Table of Contents

1. Corporate Introduction

Decision Tree, LLC is an advanced analytics company located in Greeley, CO. The company was founded in 2018 by Lee Drake, a Ph.D scientist who has published numerous scientific articles and has years of experience in the scientific instruments sector. Dr. Drake's job was to travel around the world to various businesses and research labs to find solutions to various analytical challenges ranging from the detection of impurities in solar panels to identifying economically valuable deposits of minerals in geologic cores. After visiting over 50 countries to provide help to numerous clients, Drake recognized what was missing was rapid, advanced analytics to make use of the volumes of data provided by scientific instruments. Decision Tree, LLC was founded to meet those needs.

The primary services Decision Tree, LLC offers include custom software solutions, analytics requests, and application of scientific instruments. These activities are supported by in-house development of both software and machine-learning methods.

Typical clients include geologic exploration companies, mineral extraction and production groups. scientific instrument manufactures, and university partners.

Our geographic service area is global, with services provided on the ground in the United States, India, Taiwan, Germany, and Greece within the first few months of operation in 2018. Our staff have worked on projects in over 50 countries in the past. Work is done both on-site and via cloud servers.

Our multi-pronged expertise in scientific instrumentation, geologic knowledge, and software solutions puts us in a class of our own in solving advanced problems.
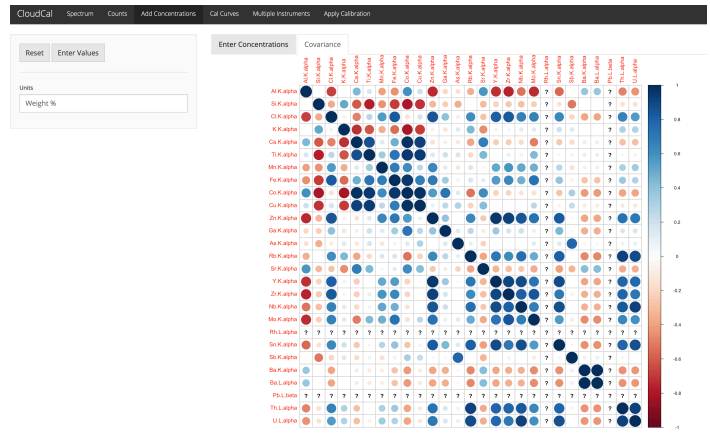
2. Profile of Professional Services

2.1 Custom Software

Decision Tree, LLC provides a variety of custom software solutions for clients. The focus is analytical, thus our specialty is providing back-end analytics, though we can provide user interfaces as part of the design. The result is a flexible and advanced analytics solution that handle heavy processing.

Specific software solutions include:

- Instrument Calibration
- Automated Solutions
- Quantitative and Qualitative Modelling
- Formation Reconstruction (Industrial + Natural)
- Customized Outputs
- Solutions Memory
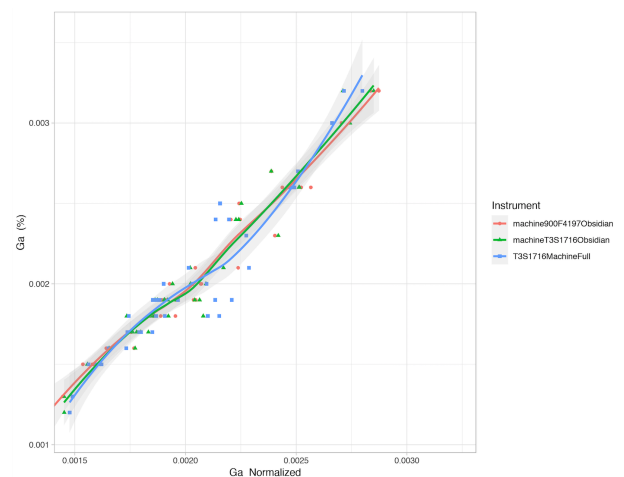- Data Visualization
- Server-Side Delivery

2.2 Machine Learning

Data is growing faster than the ability of analysts to keep up with it, and this requires a next-generation set of tools to tackle the growth head-on. Decision Tree, LLC specializes in machine learning methods to handle a wide variety of analytical problems, including:

- Stratigraphic Alignment
- Timeseries Analysis
- Pattern Recognition
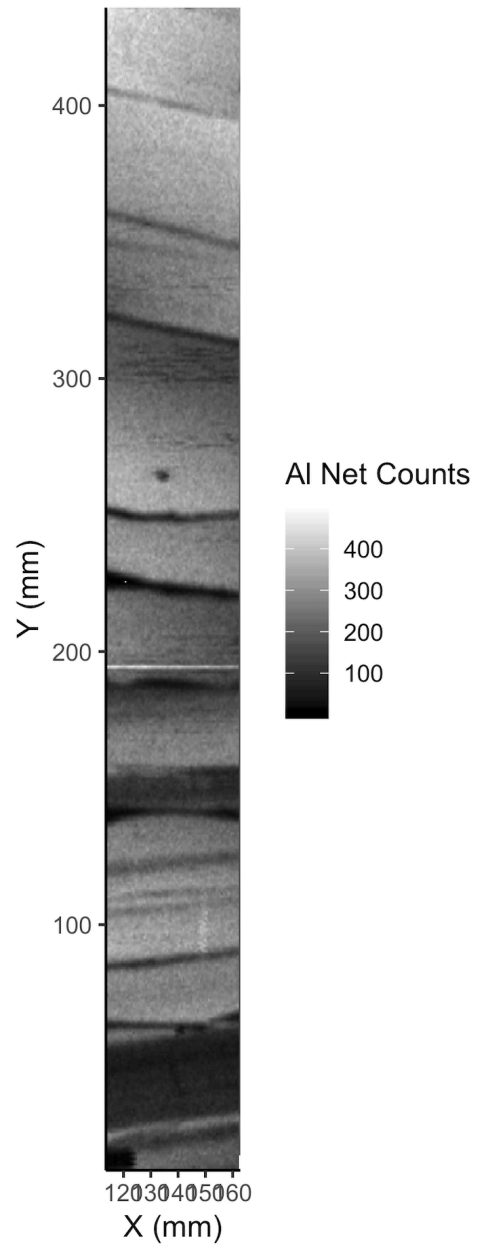- Variable Identification
- Classification
- Regression

Machine Learning

2.3 Environmental Reconstruction

Decision Tree, LLC grew out of the background of paleoenvironmental reconstruction, and while it has diversified its work, its heart remains in the past. from age modeling to paleoclimate analysis, we offer the following services:

- Age Modelling
- Paleoenvironmental Reconstruction
- Archaeological Artifact Analysis
- Artifact Provenance
- Compositional Analysis
- X-ray Fluorescence

3. Professional and Technical Staff

Decision Tree, LLC is currently a sole-owned proprietorship under Lee Drake.

Education and Training:

B.A. Anthropology, 2007, University of Wyoming. B.S. Biology, 2007, University of Wyoming. M.S. Anthropology, 2009, University of New Mexico. Ph.D. Anthropology 2012, University of New Mexico.

Representative Career Experience and Projects:
Key developer of open-source instrument calibration tools for X-ray fluorescence (XRF) and Fourier-transform infrared spectroscopy (FTIR). Has served in product development and has extensive research experience in multiple fields.

Representative projects are listed below

- On development team for both hardware and software of the Tracer 5i & 5g XRF analyzer (with Bruker Nano)
- Developed CloudCal & CloudFTIR, an open-source protocol for calibrating XRF and FTIR analyzers with traditional and machine-learning methods
- Lead the development of a world-wide database of obsidian alongside an open-source fingerprinting algorithm for provenance studies (with the Paleoresearch Institute)
- Developed an open-source geological coring application to support work at Dugway Proving Grounds (with RED Lab at the University of Utah and the US Army)
- Coordinated calibrations of XRF instruments for the World Agroforestry Center with a focus on supporting subsistence-level agriculture in developing countries (with Bruker Nano and ICRAF)
- Conducted hundreds of workshops on XRF in 50 separate countries focused on art conservation, archaeology, and geology (with Bruker Nano)
- Led a multi-year project on modeling the effects of atmospheric CO_2 increases on plants in multiple environments using historical data (with the University of New Mexico)
- Participated in archaeological excavations and surveys at Chaco Canyon (with the University of New Mexico and the National Park Service)