

Forensic genealogy: How new advances in DNA analysis can help solve decades-old cold cases

Scientists say [using math](#) to sort through DNA could help investigators put stubborn cold cases to rest. The approach combines the relatively new field of forensic genetic genealogy—solving crime by charting out DNA-based family trees—with increasing computational power to speed up and simplify this complex form of investigation.

In a new paper [recently published](#) in the *Journal of Forensic Sciences*, researchers from Stanford University, California-based Identifinders, and the DNA Doe Project explain how they developed a new mathematical model to help investigators [greatly narrow down](#) their giant pools of genetic candidates:

“We formulate a program that—given the list of matches and their genetic distances to the unknown target—chooses the best decision at each point in time: which match to investigate, which set of potential most recent common ancestors to descend from, or whether to terminate the investigation.”

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By using a decision tree to optimize the candidate search, the researchers say their new process improves the existing process for forensic genetic [genealogy](#) by a factor of ten. They can also use this protocol to pull relevant matches even from large pools with a low likelihood of success. In fact, the new algorithm is so *effective* that researchers say it “can solve a case with a 7,500-person family tree around 94 percent of the time,” compared to only 4 percent of the time with the current method, according to a Stanford University [press release](#).

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