

# A NEW WAY TO LOOK AT LAW, WITH DATA VIZ AND MACHINE LEARNING



It's that less glamorous side of the profession that Daniel Lewis and Nik Reed are trying to upend with [Ravel](#). Using data visualization, language analysis, and machine learning, the Stanford Law grads are aiming to reinvent legal research—and perhaps give young lawyers a deeper understanding of their field in the process.



Years later, when Lewis was embarking on his own legal career as a first year at Stanford Law, he was struck by how little had changed. "The tools and technologies were the same," he says. "It was surprising and disconcerting." Reed, his classmate there, was also perplexed, especially having spent some time in the finance industry working with its high-powered tools. "There was all this cool stuff that everyone else was using in every other field, and it just wasn't coming to lawyers," he says.

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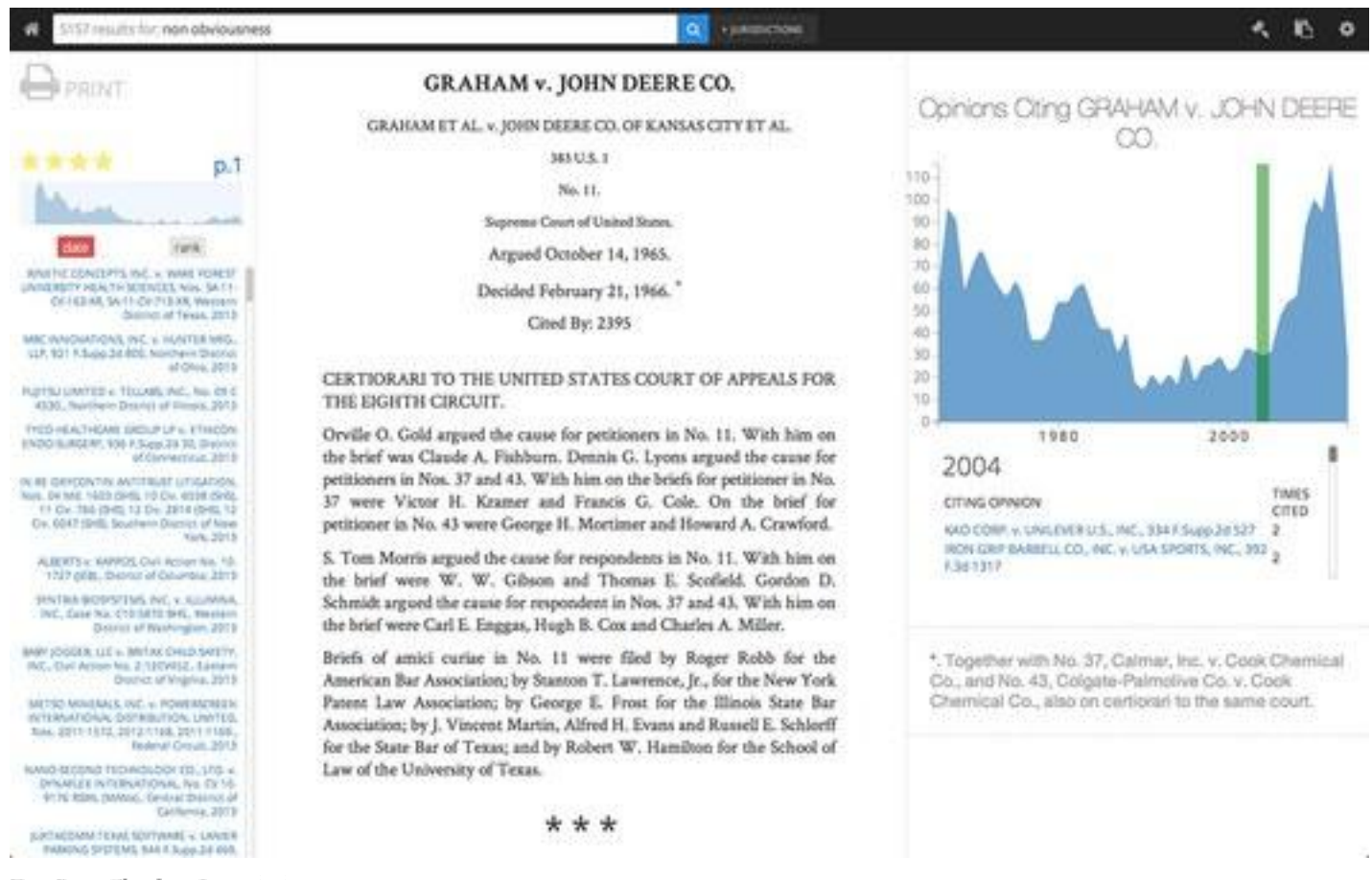
## Telling the Story of the Law

school. The site, which has since garnered upwards of \$9 million in VC funding, brings a number of powerful tools to the research process. Search results, instead of coming back as a block of text, are rendered as an interactive visualization. The cases take the form of bubbles, arranged by date. Landmark cases are nice and big; lesser cases are smaller. Lines join the circles, showing you how the cases are interrelated. You can filter these visual results in a number of ways, separating out, for instance, which rulings came from district courts, which came from circuit courts, and which were handed down by the Supreme Court itself.

Westlaw and Nexis, Lewis points out, have long reigned simply on the basis of access. They were gatekeepers to all legal history, and a subscription was an obligatory expense for any legal firm or law school. In recent years, however, much more of that information has become freely available. And with it, new tools have become possible.

As its creators see it, Ravel's visual search offers myriad improvements over the old columns of text results. It better lets you see how cases evolved over time, and potentially lets you see outliers that could be useful in crafting an argument—cases that would languish at the bottom of a more traditional search. The visualization, Reed insists, "tells a lot more of the story of law than the rank ordered list." (That might be true. When they first showed their visual search to a veteran judge, he looked at the complex map of circles and responded: "This is how my brain works!")

Ravel also has some smart touches for processing cases once you've found them. A clean interface makes it easy to skim documents, for instance, with built-in tools for highlighting and annotating text. Early users have reported that Ravel cut their overall research time by up to two thirds, on some occasions.



## Mapping the Law

Ravel's most ambitious features, however, are intended to help with the analysis of cases. These tools, saved for premium subscribers, are designed to automatically surface the key passages in whatever case you happen to be looking at, sussing out instances when they've been cited or reinterpreted in cases that followed.

To do this, Ravel effectively has to map the law, an undertaking that involves both human insight and technical firepower. The process, roughly: Lewis and Reed will look at a particular case, pinpoint the case it's referencing, and then figure out what ties them together. It could be a direct reference, or a glancing one. It might show up as three paragraphs in that later ruling, or just a sentence.

Once those connections have been made, they're handed off to Ravel's engineers. The engineers, which make up more than half of the company's ten-person team, are tasked with building models that can identify those same sorts of linkages in other cases, using natural language processing. In effect, Ravel's trying to uncover the subtle linguistic patterns undergirding decades of legal rulings.

That all goes well beyond visual search, and the idea of future generations of lawyers learning from an algorithmic analysis of the law seems quietly dangerous in its own way (though a sterling conceit for a near-future short story!)

Still, compared to the comparatively primitive tools that still dominate the field today, Lewis and Reed see Ravel as a promising resource for young lawyers and law students. "It's about helping them research more confidently," Lewis says. "It's about making sure they understand the story in the right way." And, of course, about making all that research a little less tedious, too.

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