HouseCanary

The Essential Guide to

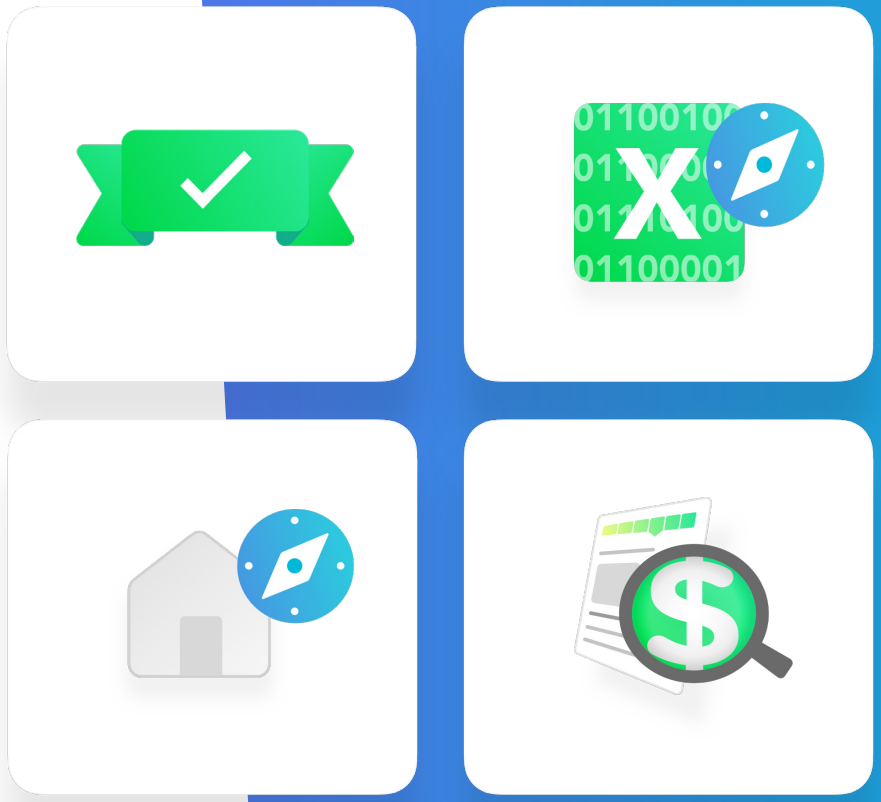
Machine Learning

Behind the buzzwords

It feels like everyone is suddenly talking about machine learning. Consumer products such as Amazon's Alexa, Google Home, and even Apple's Siri burst onto the scene within a few short years, bringing artificial intelligence (AI) into our homes and pockets seemingly from nowhere.

But the truth is that machine learning has been a cornerstone of technological development since the late 1950s. It describes the way programs use statistical techniques and algorithms to learn from data inputs. A learning machine can improve its performance without being manually programmed for those improvements — essentially evolving on its own, streamlining processes and saving engineers precious time.

Products (like the ones HouseCanary crafts) that are built on machine learning lend that same efficiency to your processes and workflows. They empower you and your team to work smarter and faster, to make better decisions, and to build and maintain an edge in a competitive landscape.



The Benefits of Machine Learning

Objectivity

A human assessor evaluating the value of a home is susceptible to all kinds of bias: aesthetics, personal experience, and social or professional pressures. Machines aren't vulnerable to the same subjectivity. At HouseCanary, our technology makes decisions based on information from millions of homes, which allows them to create an unbiased assessment of home condition, home value, view quality, and more. And they remain unaffected by the emotions that are often involved in the home-buying process.

Better still, these tools don't require much training to become proficient at a task. It could take a human assessor years to accumulate the experience to balance out any initial biases. Even early in a software product's lifecycle, it bases its outputs on a massive dataset, so it can be more objective than a human with years of experience.

Speed

The human mind is a finely tuned analytical machine. It is capable of taking diverse, complex inputs and synthesizing them into meaningful insights. But that analytical power comes at a cost: time.

Analytical machines like the ones we use at HouseCanary may not be able to process the same breadth of information as a human observer, but they can deliver equally powerful insights from narrow data almost instantaneously. Our algorithms have been trained on the same core inputs a human reviewer would use to estimate the value of a home — list prices and sales prices of comparable properties, local market data, photos of the property itself — but the program delivers a valuation in a fraction of a second, instead of hours or days.

Acceleration

There's an early-mover advantage with machine learning, Once the platform has been established, the team building it can begin to integrate new and better datasets. Then the program itself can use its past performance and the upgraded inputs to solve increasingly complex problems. This process compounds over time, leading to exponential growth in the sophistication of the core technology.

HouseCanary was founded in 2013, and our engineers and data scientists have spent significant amounts of time scrubbing and normalizing hundreds of data sources, including full public records from more than 3,000 counties and hundreds of multiple listing services. This has endowed us with a leading position in the machine learning race — one that will only continue to accelerate over time.

Machine Learning at HouseCanary

Automated valuation models (AVMs)

HouseCanary's AVMs need to identify and quantify complex relationships between the different variables that can influence home price. Machine learning allows us to quickly and efficiently determine which variables have the biggest influence on home price and weight them accordingly. It would take an army of human analysts years to calculate those relationships for every block, neighborhood, and market across the country.

And, thanks to machine learning, our models continue to improve with market needs. They can identify new relationships and emerging important variables between and within data points, then incorporate those data and relationships without any human involvement. This not only saves time for engineers, allowing them to focus on other projects to improve our real estate valuations, but it also makes the model more efficient.

Image recognition

HouseCanary uses machine-based image recognition to identify and confirm condition factors that can influence a home's price. By identifying signals that could indicate poor or risky condition, such as smoke or water damage, our tools help users make smarter decisions about whether to invest. Our image recognition technology can even identify a home that is in rehab condition or ready to sell, so our users can make decisions accordingly.

Image recognition will help HouseCanary clients make even more decisions, such as the home price and whether to negotiate price with a seller. By identifying the type of appliance in the kitchen, for example, our tools can help pinpoint the quality of the home, which can affect the price range of the home and help users understand whether a home is worth what a seller is asking. These image recognition tools confirm what human inspectors see and eliminate the need for a human review of the images.

Our image recognition tools are also central to performing a comp analysis with comparable recently sold listings; they help determine whether a comp is a high, moderate, or low match for the subject property.

Creating the future

Machine learning will continue to make workplaces more efficient — not by replacing humans, but by eliminating low-level, repetitive tasks that are prone to error. Just like scripts and macros free up engineers to focus on tasks that require their direct attention, this use of technology can release human resources to focus on higher-risk activities, decision-making, and more critical tasks.

Although many companies might like to talk about machine learning, if they can't articulate what it will mean for your work process and your employees, it might be just window dressing. At HouseCanary, we are heavily invested in creating cutting-edge technology that allows us to get even more from our team of data scientist and industry experts. The result for our clients is a suite of residential real estate data and valuation products that are faster, more accurate, and more cost-effective than any legacy tool or process.

About HouseCanary

Founded in 2013, HouseCanary is a real estate technology company providing the most accurate home valuations to drive smarter decisions across the real estate ecosystem. Clients include leading institutional investors and enterprise lenders who trust HouseCanary's products to fuel acquisition, portfolio management, underwriting, and other processes.

HouseCanary can be found at **www.housecanary.com**