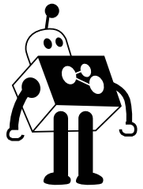
Artificial Intelligence + Machine Learning: Current Applications in Real Estate



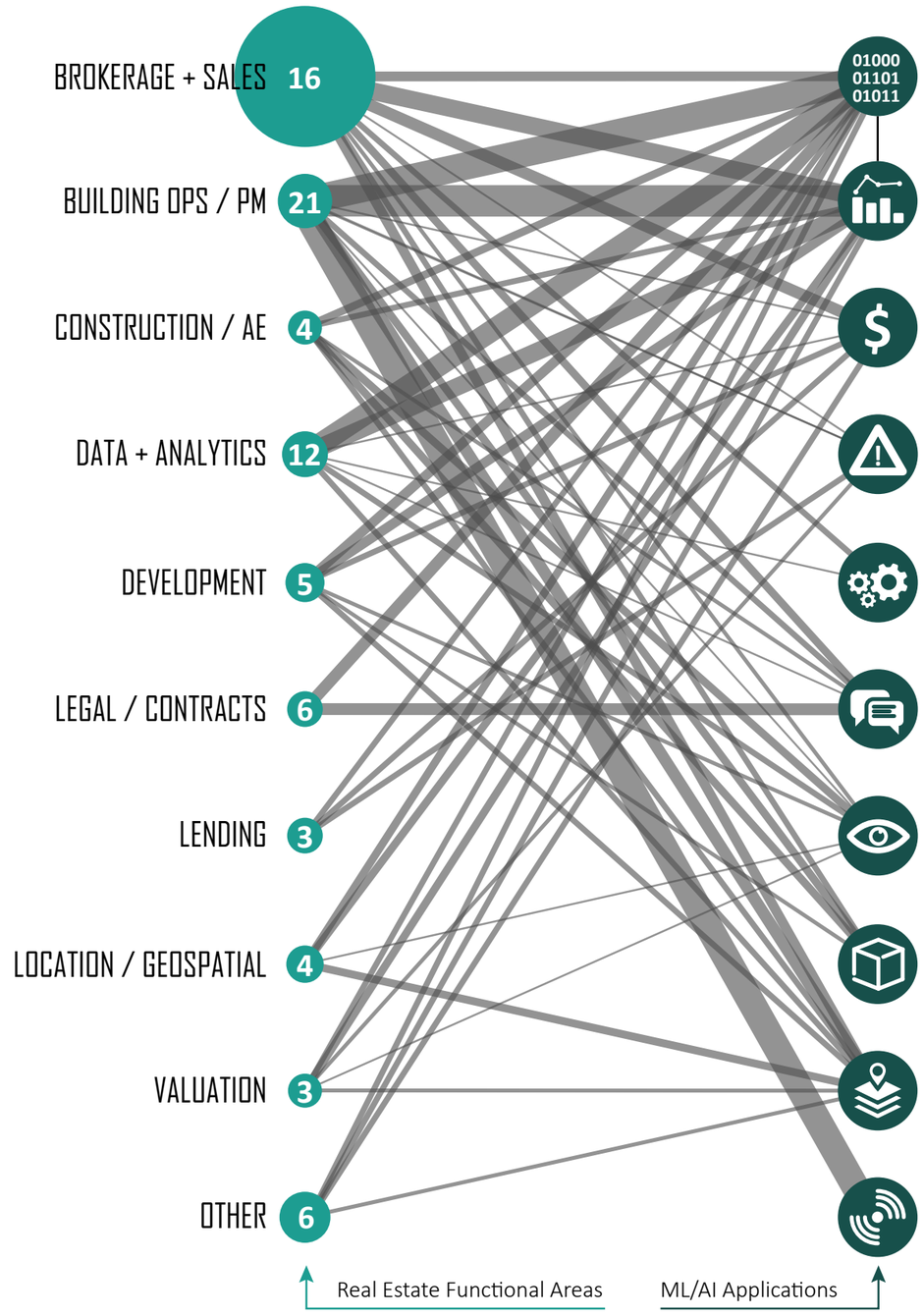
Many real estate investors, bloggers, and technology firms are asking: Is machine learning (ML) and artificial intelligence (AI) transforming our industry, or is it just hype? This question served as the basis of an exploration of the emerging ML/AI technology firms in the real estate space. The result of interviews, research, and culling a list of a few thousand firms is a collection of 80 real estate technology firms that can be said to use AI and ML, and a dive into what it means for the industry today.

ML/AI TODAY

The chart breaks down the 10 real estate functional areas along with the number of companies in each category. The size of the associated circles represents the relative funding amount going to those companies. The 10 machine learning and AI applications for real estate, are linked to the functional areas with lines sized to reflect the number of firms using a particular technology.

Many functional areas are impacted by ML and AI today, but the area receiving the most attention from tech investors is brokerage and sales, where AI and ML are now serving as the basis for real estate investment decisions. Building operations is another major area with many firms entering the space, particularly by making use of IoT technologies in commercial and residential settings.

Data is an important area of focus for many applications as is the first step to advancing our understanding of real estate and using machines learning effectively. We are also seeing exciting developments in analytics, valuation, applications of image processing, and locational data, all of which are promising areas for growing this trend in the industry. These developments are still in early phases, but the potential for improved investment data and greater efficiencies mean ample opportunities for widespread adoption in the future.



DATA

Data gathering and distribution can be accomplished with new ML tools, which have the power to capture every interaction with a new software, every sensor output, and every message sent, making these and other day-to-day elements of the real estate business into rich sources of data.

ANALYTICS

Analytics using machine learning has great potential to enhance our understanding of the built world and investment. As datasets grow, it is important to track which companies begin to develop truly sophisticated data analysis methods to leverage that data.

VALUATION

Real estate **valuation** is key to the business in areas such as sales, portfolio management, REIT valuations, tax assessment, and lending. Automated valuation models using ML tools improve predictive abilities, and also streamline appraisal and assessment processes.

RISK

Risk assessment using machine learning can produce a better understanding of thousands of potential risk factors. Lenders can optimize borrowing levels and rates and insurance companies can balance customer demand and potential costs.

BUSINESS PROCESSES

Business processes can be enhanced through new software with structured, purpose taylored environments. These environments become data sources in themselves, recording and learning from every customer interaction.

NLP / NLG

Natural language processing (NLP) and **Natural language generation (NLG)** give computers to ability to read text and communicate back to us in “human” terms. These tools are used in chatbots, contract review and data extraction, data gathering, and document writing.

COMPUTER VISION

A picture is worth a thousand words, especially with powerful tools using **computer vision**, which allows computers to interpret images and video. It can be used for value assessments, people tracking, and reading documents.

3D ANALYSIS

AI and ML technologies are enabling a wide range of new approaches to mapping, designing, and constructing the built world. With machine learning technology, **3D analysis** for image augmentation and space planning can be performed quickly and efficiently.

GEOSPATIAL ANALYSIS

Geospatial analysis is the use of geographic coordinates in data display and analysis. The importance of location is not lost on the machine learning scientists who have developed interesting locational anlaysis tools.

IOT

The massive datasets coming from **Internet of things (IoT)** technology, where physical objects in our environment are internet connected, will enable us to see patterns in human behavior, including interactions with the physical environment.

MIT Center for Real Estate

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Full MIT research paper available at j-conway.com

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