



How realtor.com® uses Data to Elevate Consumer and Customer Experiences

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4/24/2018

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realtor.com®

What problem are we going to solve?

1

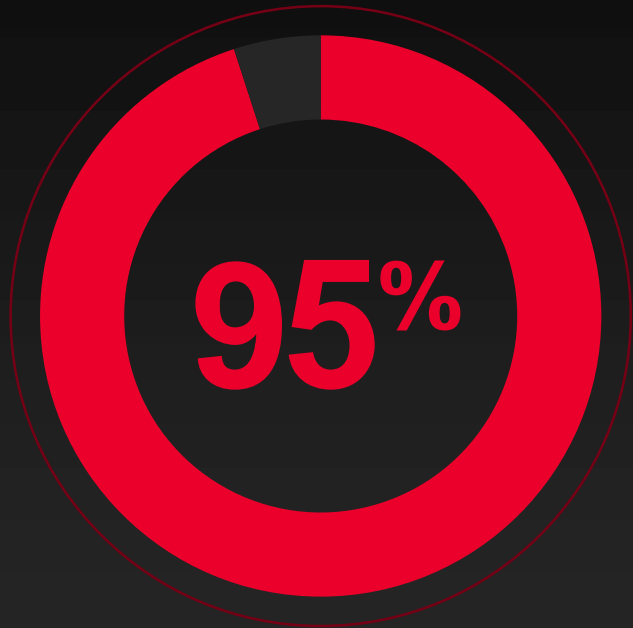
Agents have
to log into multiple
systems to run their
business



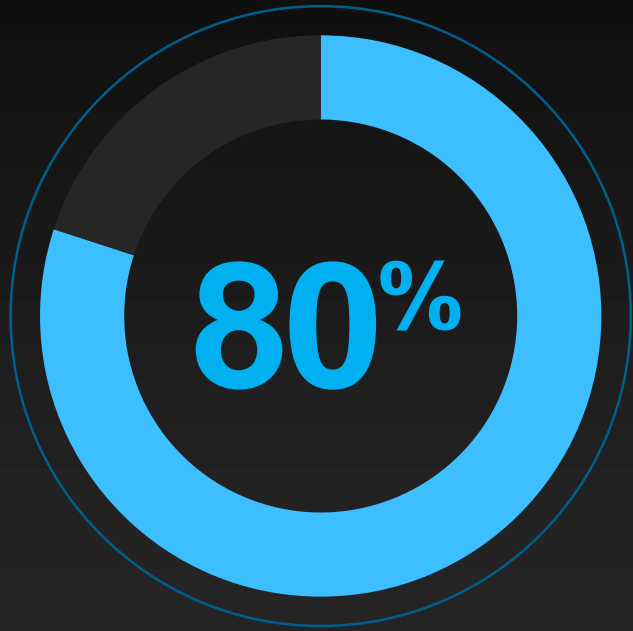
2

Consumer expectations
are high and
REALTORS® must step
up to meet them

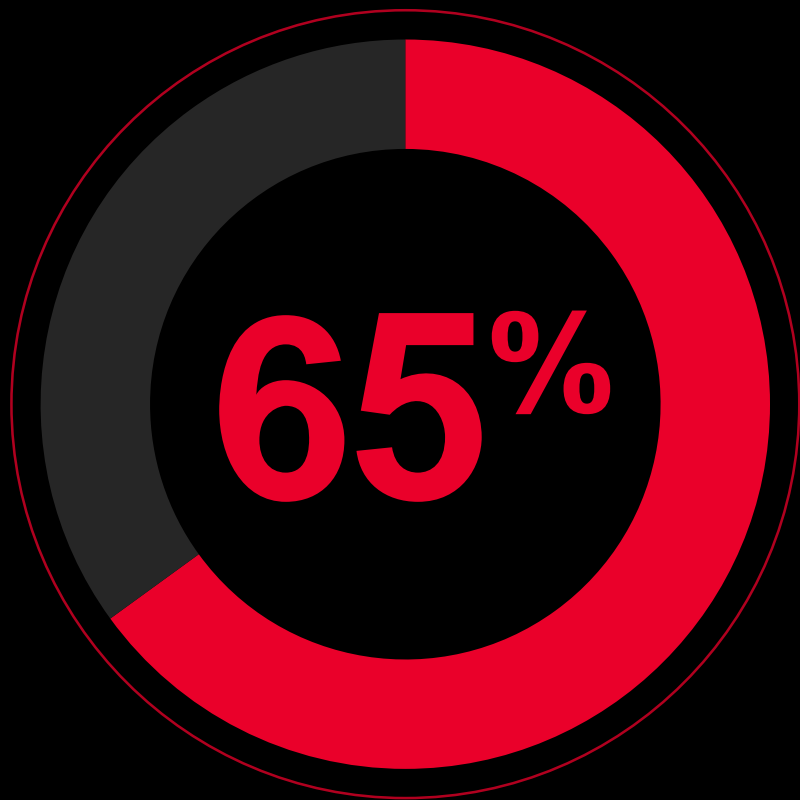




Know price
range & more



Know
neighborhood



Expect a
response
in under an
hour

3

Data is useless if it is in
multiple systems



1

Agents have to log into multiple systems

2

Agents must meet increasing consumer expectations

3

Data is useless if it is in multiple systems

A man in a dark suit is performing a yoga pose on a wooden deck. He is in a standing position with one leg raised and bent, and his arms are extended forward. The background features a modern house with large windows and a wooden exterior. A bicycle is parked near the house. The scene is set outdoors, with a swimming pool visible in the foreground.

realsuiteSM
Keep Doing You.

Our Research Findings

What do real estate professionals want?



Capture *more leads*

Communicate *faster with leads*

Close *more deals*

...

All in **one easy-to-use system!**

The **realsuite**® Solution

The answer to an unmet need in the market...



respond



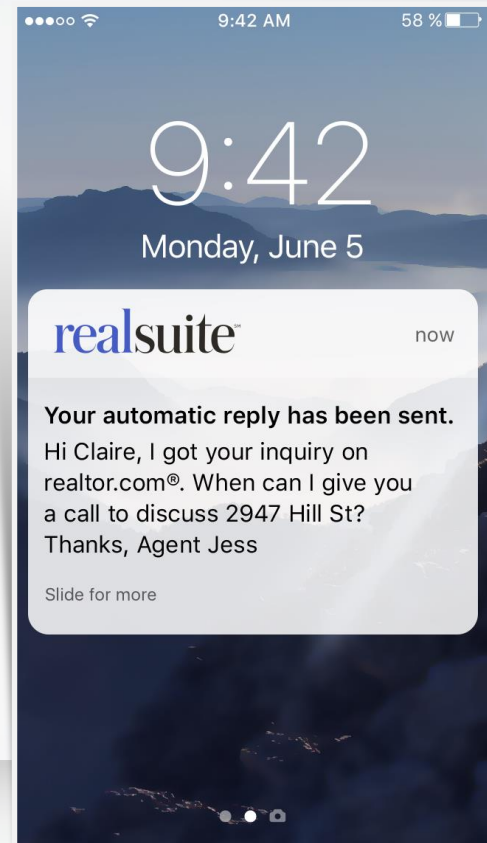
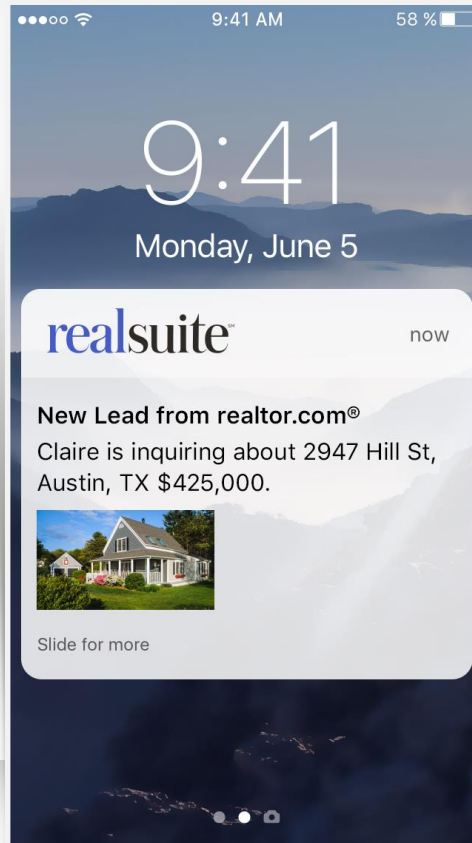
connect



transact



respond



Consumer Communication Preferences vs Agent Contact⁵

PREFERRED COMMUNICATION



- 32% - EMAIL
- 31% - TEXT MESSAGES
- 22% - PHONE
- 15% - IN PERSON

HOW AGENT INITIATED FIRST CONTACT



- 42% - PHONE
- 24% - EMAIL
- 19% - IN PERSON
- 15% - TEXT MESSAGES

⁵Source Realsuite Consumer Survey, Sept 2017



Get Personal

70% of respondents said they received a personalized response which led to a higher overall satisfaction and a greater likelihood of using the agent⁴.

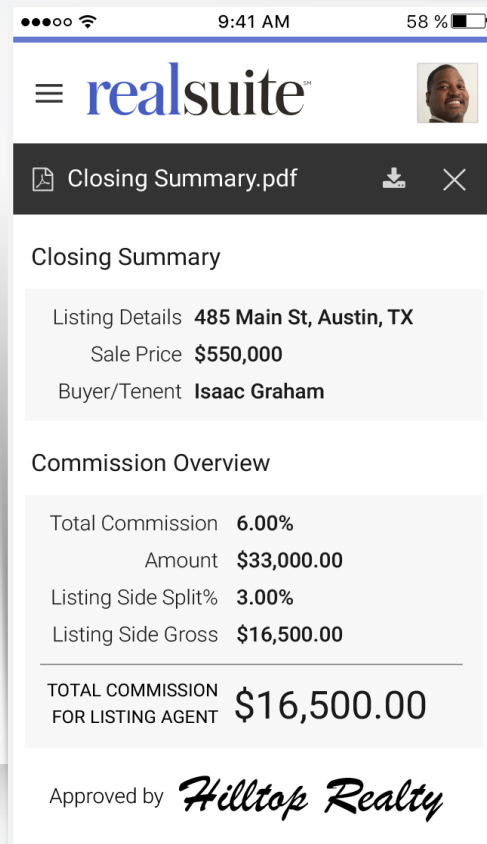
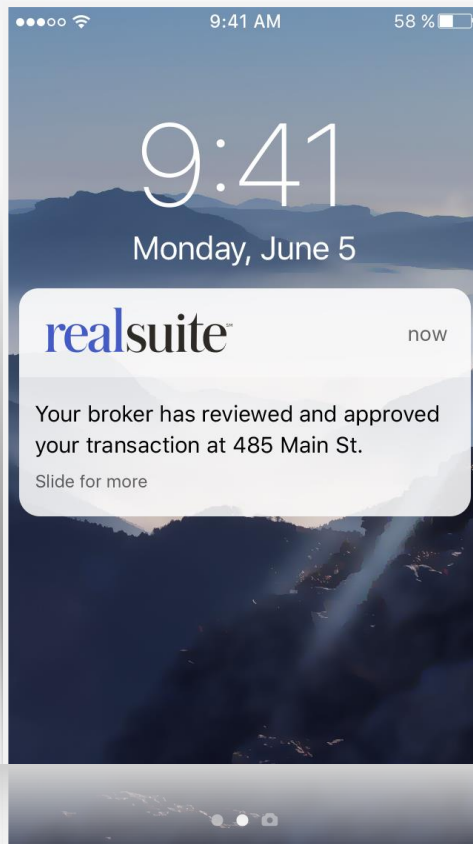
14% Among those who received a message they perceived to be automated, only 14% said they were likely to use that agent⁴.

⁴ Source realtor.com® Lead Quality Research, Consumer Insights, Sept 2017



transact

realsuite™



Transparency

Consumers expect instant gratification

73% buyers would like an online system to track the offer-to-close process⁵

50% of consumers feel the process is not transparent enough⁵

⁵Source Realsuite Consumer Survey, Sept 2017

Consumers Want Transparency



want email updates
upon task completion

realsuiteSM beta

**1) Beta User
Feedback Helping to
Shape the Product**

**2) Soft Launch at
Recent Franchise
Shows – First
Users Live!**

**3) GTM Launch
Phased into Sales
Channels Soon**

507
SHARES



FACEBOOK



TWITTER



LINKEDIN



EMAIL

TECHNOLOGY

Realtor.com owner tests the ‘holy grail’ of agent software

Move Inc. combines the best of its top platforms into one master system

BY TEKE WIGGIN | SEP 18

Future-Proof: Navigate Threats, Seize Opportunities at ICNY 2018 | Jan 22-26 at the Marriott Marquis, Times Square, New York

RESERVE NOW

Take FiveStreet’s lead-follow up, mix it with Top Producer’s CRM and add Reesio’s transaction management. What do you get? One system to rule them all, and a big real estate tech experiment from realtor.com parent company

Recruit and retain the **best agents.**

We make growing and maintaining your brokerage easy.

We can help.

Learn now



MOST READ

Realtor finds two dead bodies inside home for sale

BY BRITT CHESTER | OCT 17

Family sues brokerage over Beverly Carter's murder

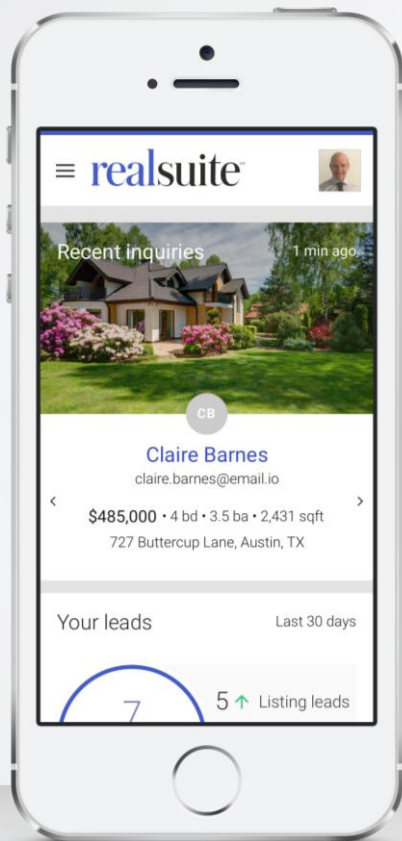
BY MARIAN MCPHERSON | OCT 13





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Suggested follow-ups

4 more

Maria Stephens
Responded to automatic follow-up 15 min ago
Inquired about 409 Ardour Ave, Unit 2 2 days ago
+ 8 more
Now is a good time to connect in-person
Call Snooze Wrap up past call

Your leads

Last 7 days

8 Leads received

Want to know more about your lead conversion?
Upgrade to Connect

View your lead performance



Kelly Agent
Real estate is more than a people business, it's REAL business.

Email kellyagent@doverrealty.io

Phone Mobile (123) 456-7890
Office (123) 123-1234

Edit your profile

Your listings

Last 7 days

8 total listings

2.1M ↑
Search result displays

285k ↓
Listing detail views

1,025 ↑
Listing leads

Manage your listings

Insights and information

Be the local market expert

Impress your clients with the latest info

Are listing prices going up or down? What about days on market? Find out with accurate data from 800 MLs. See how your local market is trending, then easily share with your clients on Facebook, Twitter or email.

See and share local market trends

Product settings

Advantage™ Pro leads & branding
Giving you the visibility you need.

Turbo
Boosting your listings to the top.

Connections™ for Buyers
Helping you connect and engage with buyers.

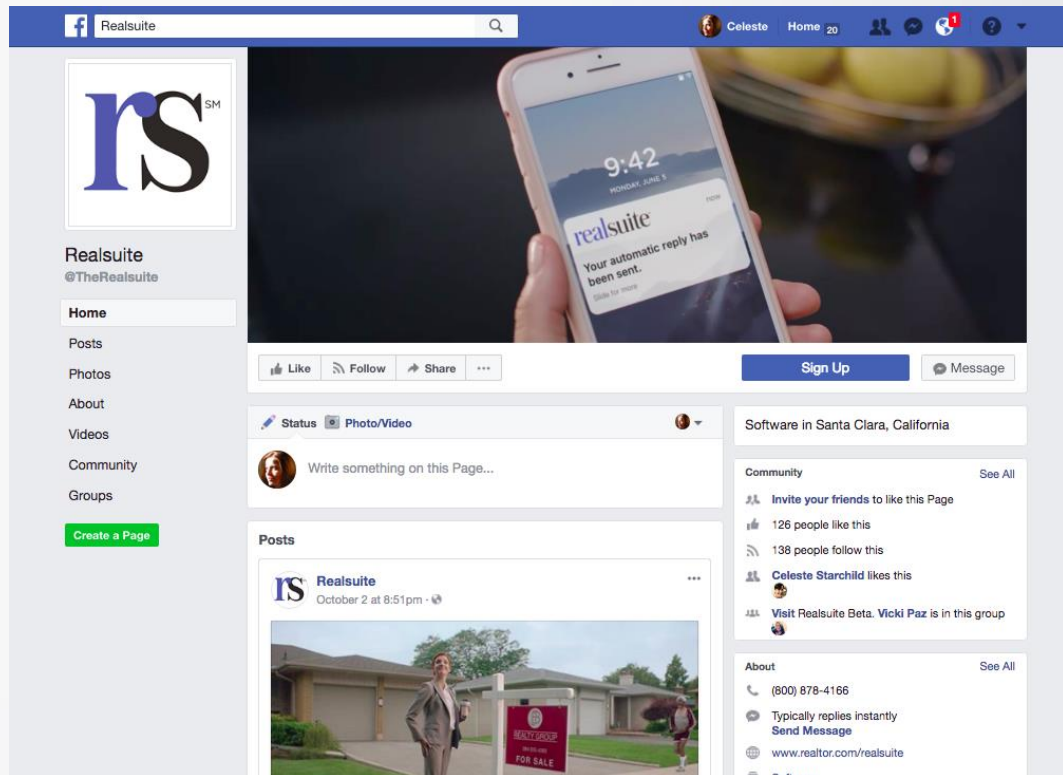
Profile leads
Building you a strong brand impression.

Courtesy leads
Making sure you get the leads you deserve.

Video for your clients
Be the #1 resource
Share useful video content
When home buyers and sellers in your area have questions, make sure you have the answers. Beef up your website, Facebook page and emails with videos about home buying, mortgages and more.
Get free tools and content

Follow our social pages

- LinkedIn
- Twitter: @therealsuite
- Instagram: @therealsuite
- FB: facebook.com/therealsuite
- And realsuite.io





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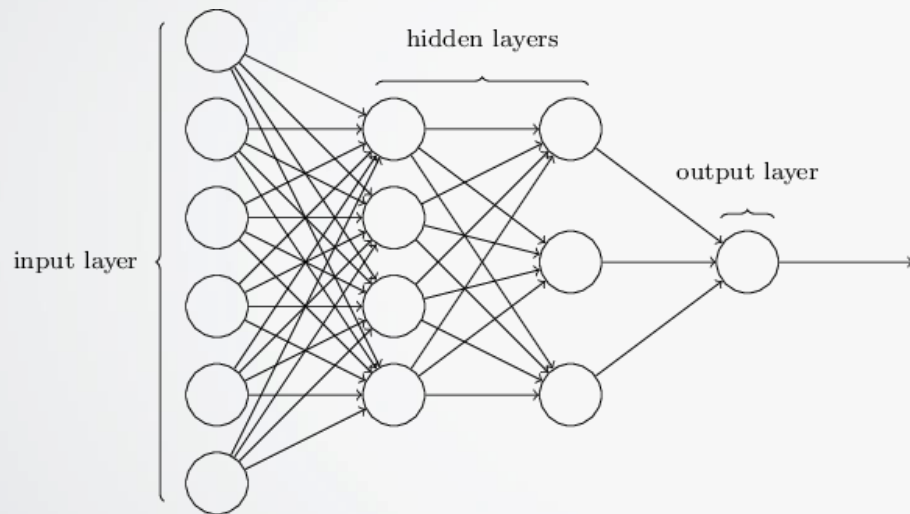
4/16/2018

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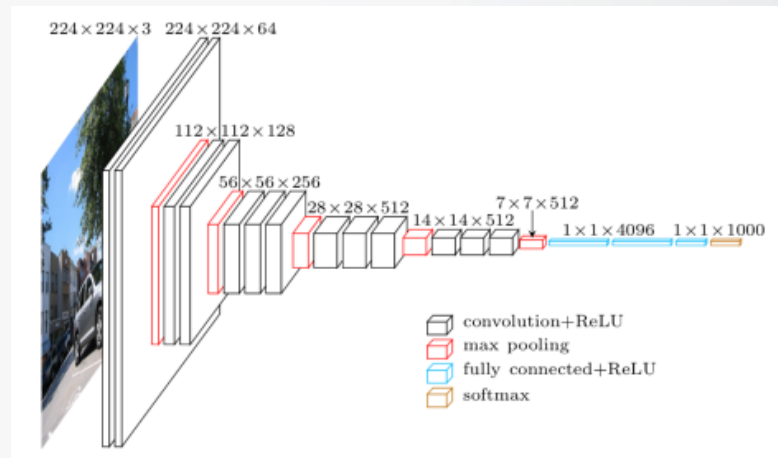
What is Deep Learning?

Neural Networks with many layers



Multi-layered Perceptron

vs



VGG16 (Oxford)

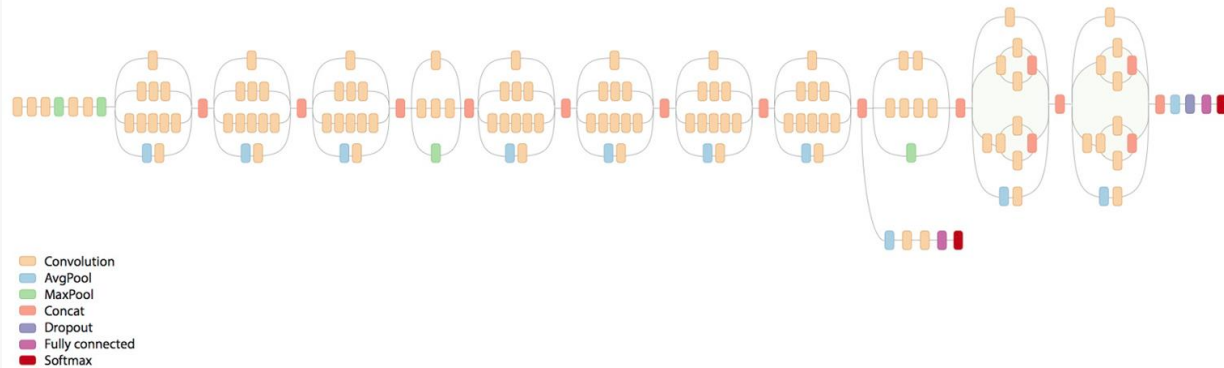
Source: Multi-Layered Perceptron, <https://github.com/ledell/sldm4-h2o/blob/master/sldm4-deeplearning-h2o.Rmd>

What is Deep Learning

Neural Networks with many layers



Image via Warner Bros. & knowyourmeme



Sources: <http://knowyourmeme.com/memes/we-need-to-go-deeper>
Inception, <https://github.com/tensorflow/models/tree/master/research/inception>

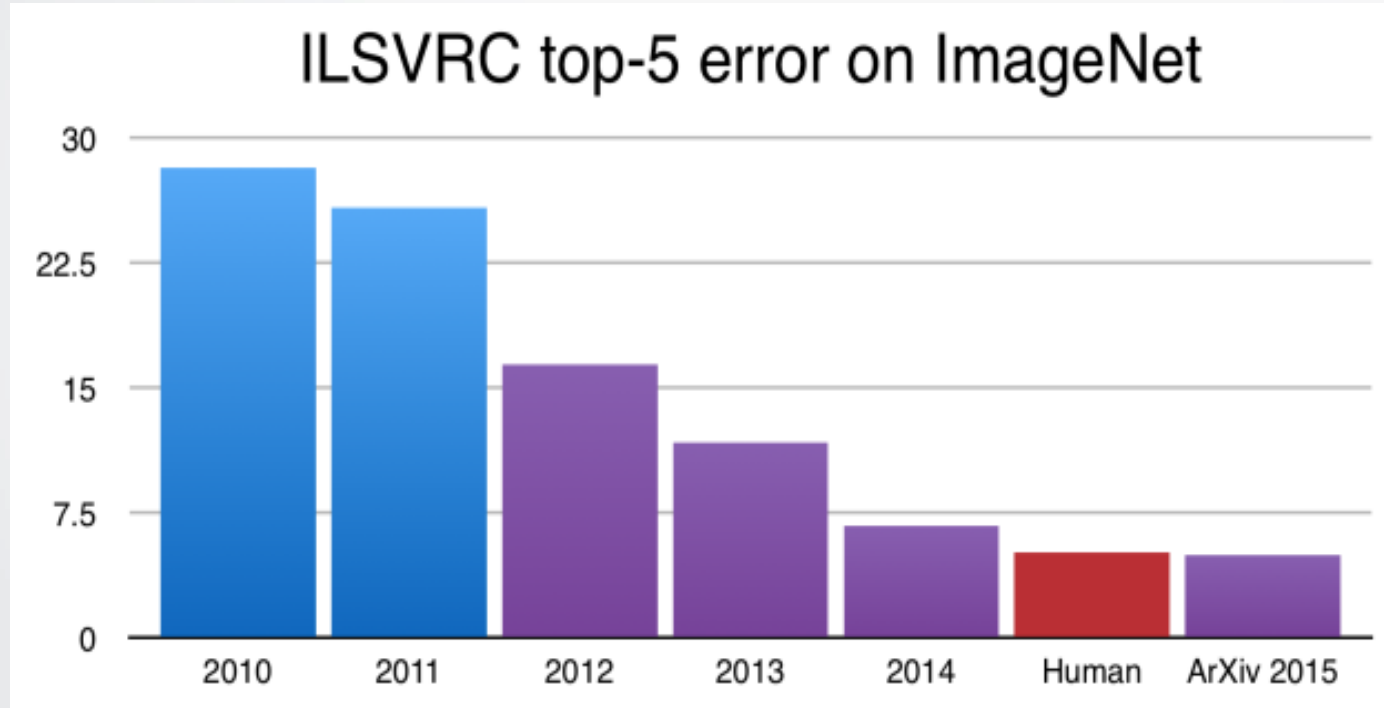
How did it come about?

Neural Nets have come a long way in the last 5 years



Image Classification

Better than human performance on ImageNet



2015 - 3.57%
2016 - 2.99%

Source: ILSVRC, <https://devblogs.nvidia.com/mocha-jl-deep-learning-julia/>

Image Classification

Image Classification

Part of LDP property features:

Property Features

Bedrooms



- Number of Bedrooms: 3

[See More](#) ▾

Bathrooms



- Number of Full Bathrooms: 2

Kitchen and Dining

- Countertop - Granite
- Dishwasher
- Garbage Disposal
- Microwave
- Oven Range - Built-In
- Gas
- No Formal Dining Room

Exterior and Lot Features

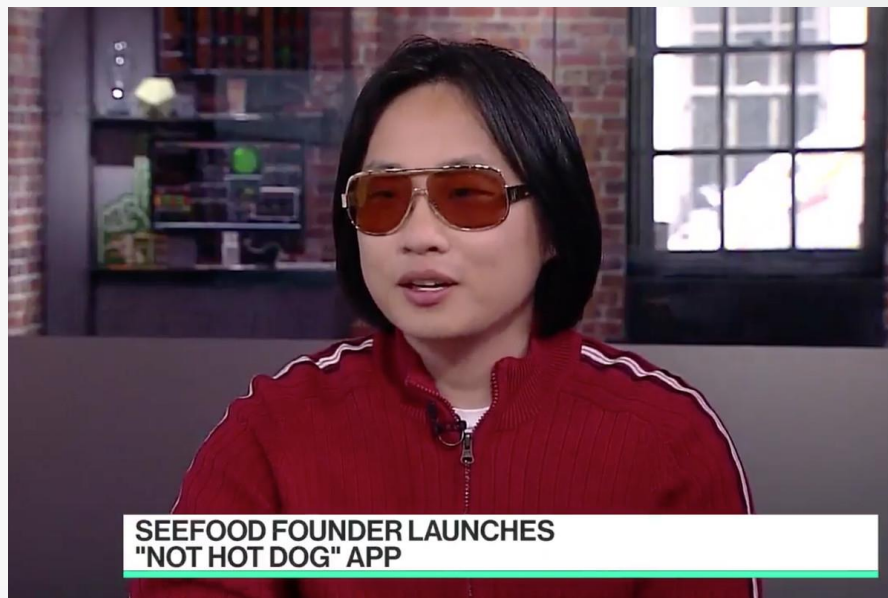
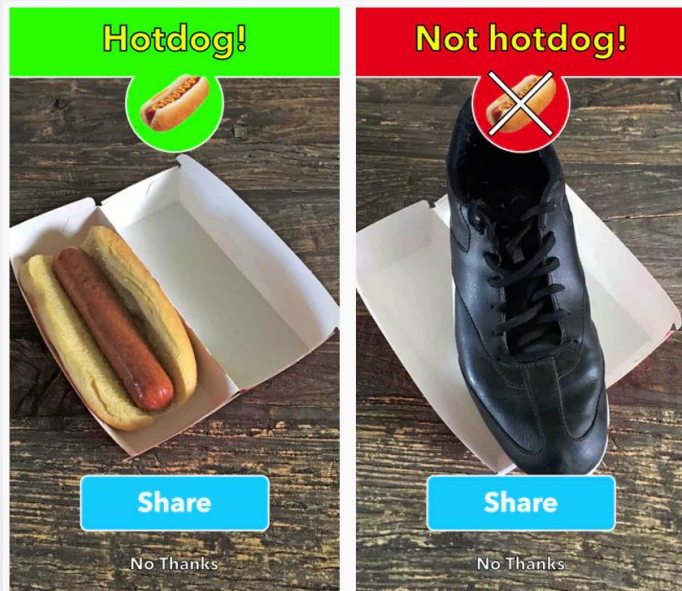
- Back Yard
- Fenced
- Low Maintenance
- Sprinklers - Auto
- Lot Acres: 0.0487
- View of Greenbelt
- View of Mountains
- View of Neighborhood

Find out more about this property.

Contact Agent

Image Classification Transfer Learning

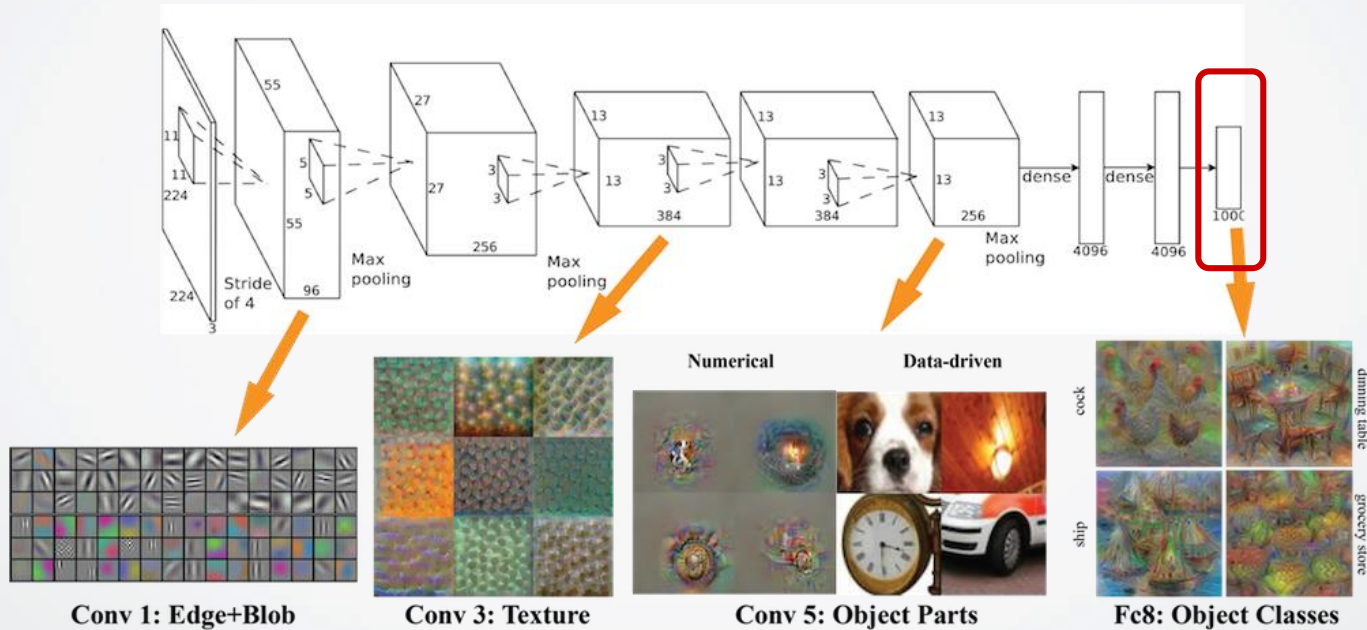
Hotdog! Not hotdog!



Source: Hotdog, <https://wccfttech.com/the-not-hotdog-app-from-hbos-silicon-valley-is-a-real-deal-and-you-can-download-it/>

Image Classification Transfer Learning

Applying knowledge gained in one problem to different but related task

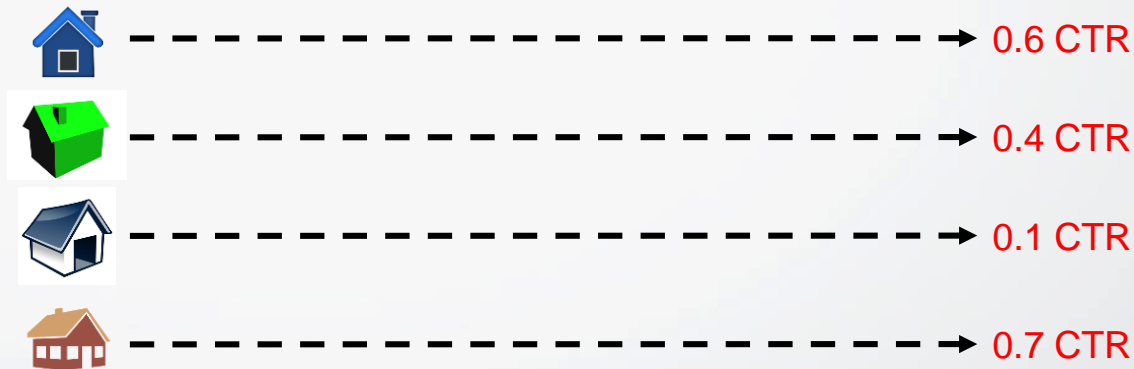


Source: https://www.csie.ntu.edu.tw/~yvchen/f105-adl/doc/161103_ConvolutionalNN.pdf

Image Clickthrough Prediction

Setup

- Deep Learning Model for image quality scoring
- Generated a model to map features of images to CTR
- Goal: feed the model an image, get back an accurate CTR



Setup

- Find listings that appeared in the top 5 positions of SRP
- How many impressions and clicks did each listing get in this context?
- What was the click-through rate (CTR)? (clicks/impression)
- Can we predict the click-through rate from the SRP photos alone?

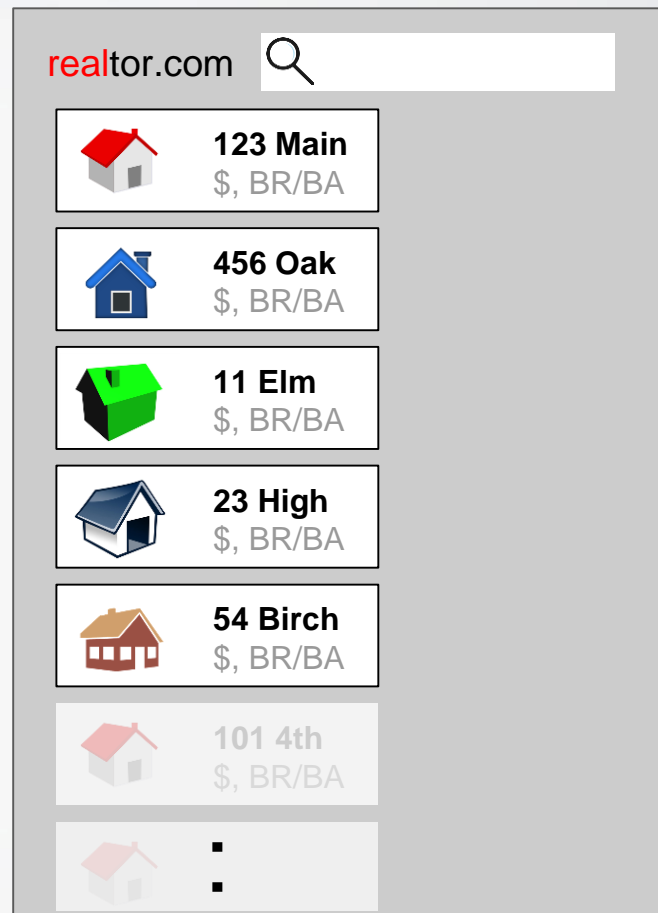


Image Classification vs. CTR Prediction

Image Classification Architecture



Convolutional
Layers



Image Tag
Prediction

Kitchen

Bedroom

Bathroom

Exterior

...

Extracting Image features for differentiating image types:

- Outdoor vs indoor?
- Counter vs bed vs bath

Image CTR Prediction Architecture



Convolutional
Layers



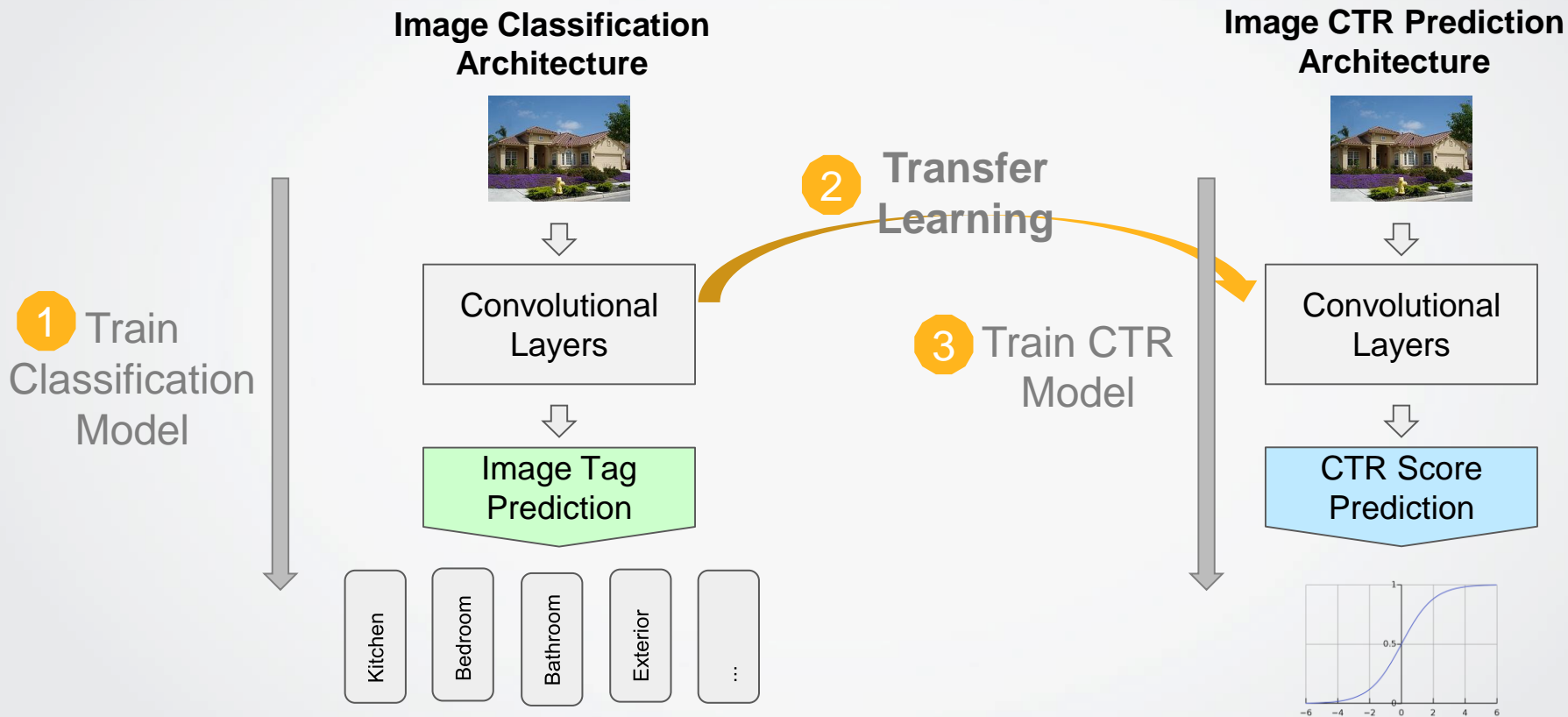
CTR Score
Prediction

Extracting image features that make it more “attractive”:

- Natural light
- Object fully captured
- etc



Transfer Learning Again



Results

Images with predicted high CTR:



Images with predicted low CTR:



Results

Images with high predicted CTR:



Images with low predicted CTR:



Results

Better image of the same listing



Images shown on Search Results



Conclusions

- 2018 is the year of deep learning adaption in industry
- At realtor.com®, deep learning is used for improving user experience
- Transfer learning is the key to leverage deep learning
- Creative applications of deep learning opens up new opportunities for innovative product

Thank you

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