FIND YOUR HOUSE THE SMART WAY

smartRE

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The Problem: Migrating Workforce

~7.5 M people moved state-to-state in 2016: how did they find their new home?

smartRE is dedicated to helping the relocating worker find their next home
User Preferences Captured via Survey

User inputs obtained from a short survey comprised of budget allocations and filter values

Budget allocations personalize the model output:
- House (sq. ft, age, etc)
- Neighborhood (school quality, crime rates, etc)
- Location (walkscore, near parks/grocery, etc)
- Relative importance of the above categories

Filters focus the model output:
- Max price
- Min/Max bedrooms
- Type of property - house / condo
- Distance from user provided waypoint
Top 10 Curated Homes Presented to User

Purchasing a home is a highly emotional and sometimes overwhelming process.  

- smartRE reduces available inventory to a manageable set for consideration. 
- Input preference modification and exploration of inventory is available on demand.
Model Predicts Relative Perceived Value

Step 1: Train on Integrated Database

- Features
- Actual Value

Random Forest

Get Feature Importances

Feature Coefficients

User Score

Perceived Feature Values

Built-in Hyper-parameter

Weighted Actual Value

Built-in Hyper-parameter

Perceived Property Value

Output for evaluation

Properties’ Ranks

Top 10 Properties

R^2 score = 0.93 (full dataset)
Model Provides an Even Playing Field

Compare model-generated personal rankings vs. user-identified rankings

- Evaluation inputs and labels
  - Survey of LA native and non-native residents: answer survey and rank 10 sample properties based on interest

- Hyperparameters tuned based on best accuracy
  - Pairwise rank comparison provides accuracy
  - Top 2 recall at 5 provides usefulness

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<th>Property ID</th>
<th>Model Ranks</th>
<th>User Ranks</th>
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Model Results

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<tr>
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<th>Pair-Wise Accuracy</th>
<th>Top 2 Recall at 5</th>
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<td>Non-Local</td>
<td>0.508</td>
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<td>LA Local</td>
<td>0.556</td>
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![Graph showing Pair-Wise Accuracy and Top 2 Recall at 5]
Backend Designed for Speed

- Single GCP Deployed instance @ 4GB RAM
- Static IP address
- Domain DNS smartre.live

- Model Python Files, Front End and Integration all on one machine
  - Speed, very low latency
  - Easy replication
SmartRE is Functional and Beautiful

Demo of website  smartre.live/Home
Integration with MLS
- IDX integration, yielding current inventory
- Real Estate Agent recommendations based on correlation

Upgraded model and inputs
- Improved model accuracy based on tuning to user experience
- Bayesian inputs based on user favorites
- Multiple waypoint anchors with time based radius

Expansion to more cities
- San Francisco, New York
Any questions?

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Homebuyers with personal preferences

Unfamiliar neighborhoods with unintegrated information