AVM User Manual
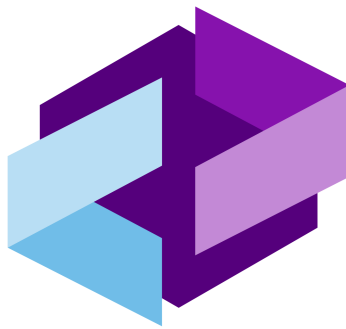
GRP TEAM 13
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1 Introduction

Welcome to **AVM-GRP**. This is an automated property valuation system with a user-friendly interface. It offers many useful features. This system is designed for both general and professional users. With this user manual, you will learn how to use this system.

2 Get Started

2.1 Click "GET STARTED"

As shown in Figure 1, click this button and turn to the mode selection page.
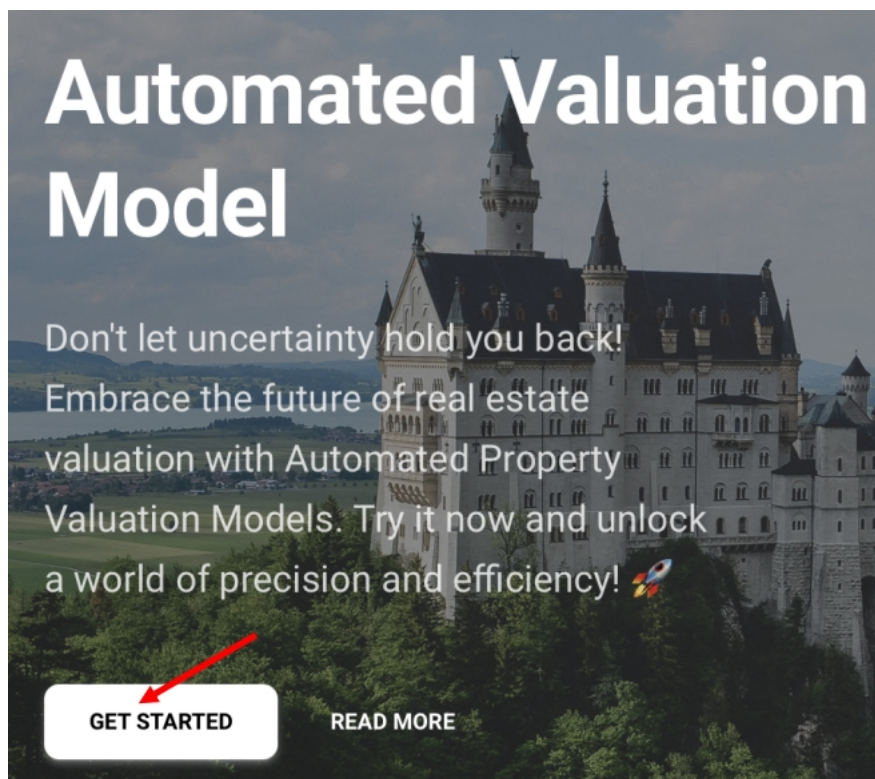

Figure 1: Click "GET STARTED"

2.2 Choose mode

In Figure 2, we can see two kinds of modes can be chosen: `Normal Mode` and `Professional Mode`. Here is a short description of the two modes.

Normal Mode: This mode has an easier operation procedure and detailed guidance. It is designed for users who do not understand real estate very well. If it is your first try, we recommend you choose it. Click the button `TRY IT!` to start this mode.

Professional Mode: This mode has more functions and higher permissions for use. It is designed for professional users, such as real estate agents. This mode provides historical prediction search,

single prediction, and batch prediction functions. Do not select this mode if you do not know what you are doing. Click the button `GO!` to start this mode.
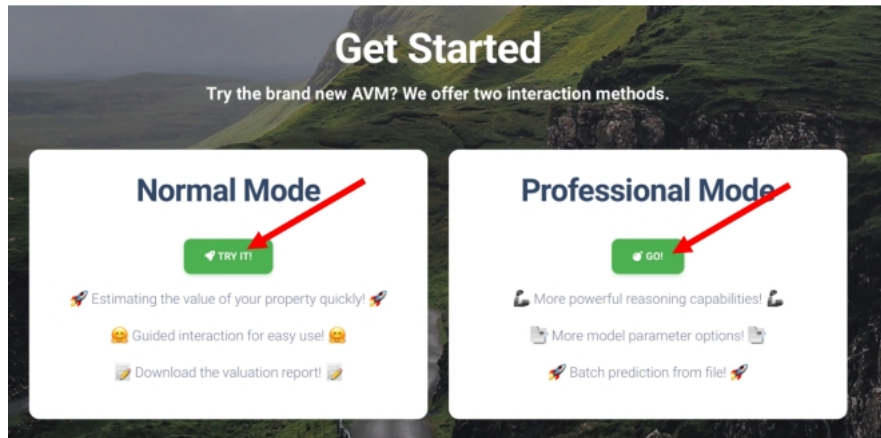

Figure 2: Choose mode

3 Normal Mode

3.1 Base information input

This part is the most basic and important information of the house. It directly affects the prediction result. Please fill in as much as possible.

3.1.1 Location Information

As shown in Figure 3, we need to input "address", "zipcode", "latitude" and "longitude". This part is optional, you can choose what you know to fill in. Filling in can improve the accuracy of price prediction.

- Address: The address of your house.

- Zipcode: Input the zipcode of the house can improve the accuracy of price prediction. It is helpful to narrow down the search. E.p. 98001.

- Latitude: Input the latitude of the house. E.p. 47.

- Longitude: Input the longitude of the house. E.p. -122.

Notes:

- You may need to use some mapping software, such as Google Maps, to get a better idea of the latitude and longitude of the place.

- Since the software's datasets are mainly concentrated in a small town in the United States, in order to make the data more accurate, the software currently supports the query of house price estimates in that place. If you use this system to predict property values in other areas, the results are unreliable.

Figure 3: N Mode 1

3.1.2 General information

As shown in Figure 4, we need to input "Bedrooms number", "Bathrooms number", "Living size" and "Lot size".

- Bedrooms number: The number of bedrooms in the house. E.p. 2.

- Bathrooms number: The number of bathrooms in the house. E.p. 2.

- Living size: This is often used to describe the internal living area of a house, excluding non-residential spaces such as garages, basements, etc. E.p. 1000.

- Lot size: The total area of the house. It includes exterior space such as a garden. E.p. 100.

Notes: The unit we use here is **square footage**. 1 square meter is equal to 10.7639 square feet.

Figure 4: N Mode 2

3.1.3 Details information

As shown in Figure 5, we need to input "Floors", "Is waterfront?", "The size above basement" and "Basement size".

- Floors: The number of floors. Don't need to mind the basement. E.p. 2.

- Is waterfront?: Whether your house is near the water. Usually, the price of a house by the water is higher. E.p. Yes

- The size above basement: The total area of the house above ground level. It includes the attic. E.p. 1400.

- Basement size: The total area of the basement. E.p. 60. If this house doesn't have the basement, please fill 0 instead.

Figure 5: N Mode 3

3.1.4 More Information

As shown in Figure 6, we need to input "Built year", "Renovated year", "Living size in 2015" and "Lot size in 2015".

- Built year: The year of the house when was built. E.p. 2000.

- Renovated year(if not, enter 0): The year of house when was repaired. If the house was never repaired, enter "0". E.p. 0.

- Living size in 2015: The size of living space in 2015. Usually, it is same as now. E.p. 100.

- Lot size in 2015: The total area of the house in 2015. Usually, it is same as now. E.p. 120.

After you finish filling the base part. Please click the orange button **FINISH** to the next step.

Note: This part is optional, you can choose what you know to fill in. Filling in can improve the accuracy of prediction results. If you are not sure, put 0.

Figure 6: N Mode 4

3.2 Skip or Continue

In Figure 7, we can see two buttons can be clicked: `Skip!` and `Go!`. If you want to add more details, please click `Go!`. And you will get more powerful reasoning and more accurate prediction results.

Of course, you also can skip this part. If you want, click the `Skip!`, and the result will be shown.
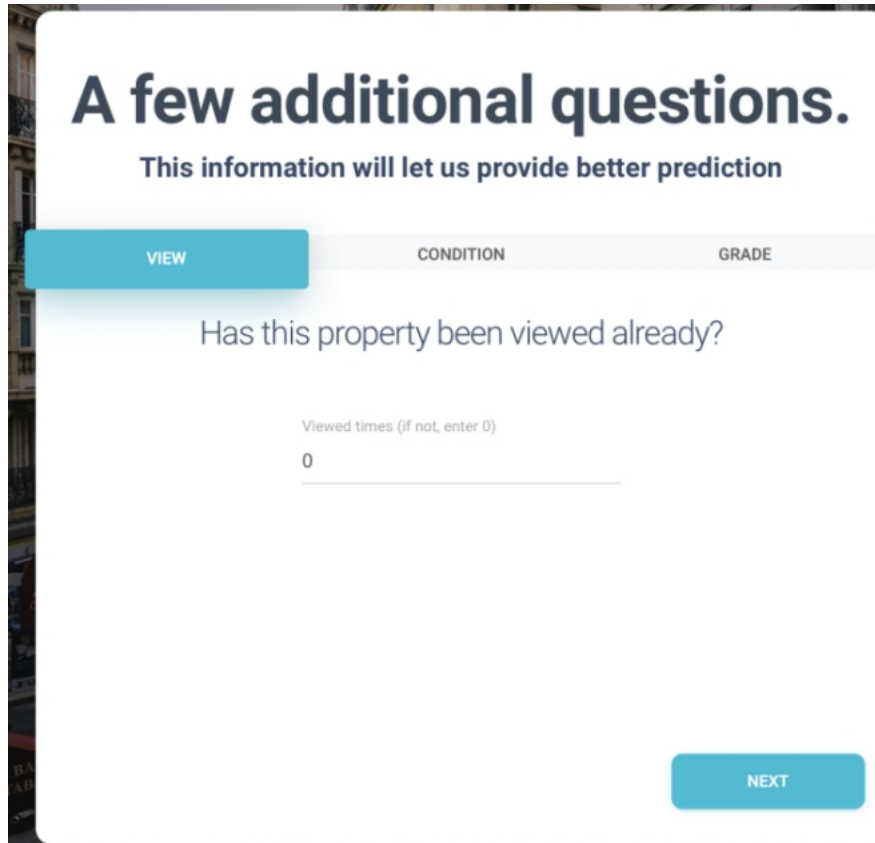

Figure 7: Skip or Continue

3.3 Additional Information

This part is an extension section. In fact, It directly affects the prediction result.

In Figure 8, you need to input the times the property has been viewed already. If you are not sure, enter 0.

Figure 8: N Mode P 1

In Figure 9, you need to score for the condition. If you think the condition is very nice, select 5 stars, if not good enough, select 1 star by clicking the corresponding star.

Figure 9: N Mode P 2

In Figure 10, you will need to provide scores given by other property appraisers or systems. If you are not sure, enter 0. Usually, the grade is not over 13.

After finishing the input, click the button `finish`, and the result will be shown.

Figure 10: N Mode P 3

3.4 Normal Mode Result

The final result by normal mode will be shown on this page. Just like in Figure 11, you can see the prediction price, reasons, and statistics. Also, if you want to download your results as a PDF file, you can click on the `DOWNLOAD` button.

Figure 11: N Mode Result

4 Professional mode

In Figure 12, we can see three buttons can be clicked: **Historical**, **Single** and **Batch** Prediction. Their functions will be explained next.
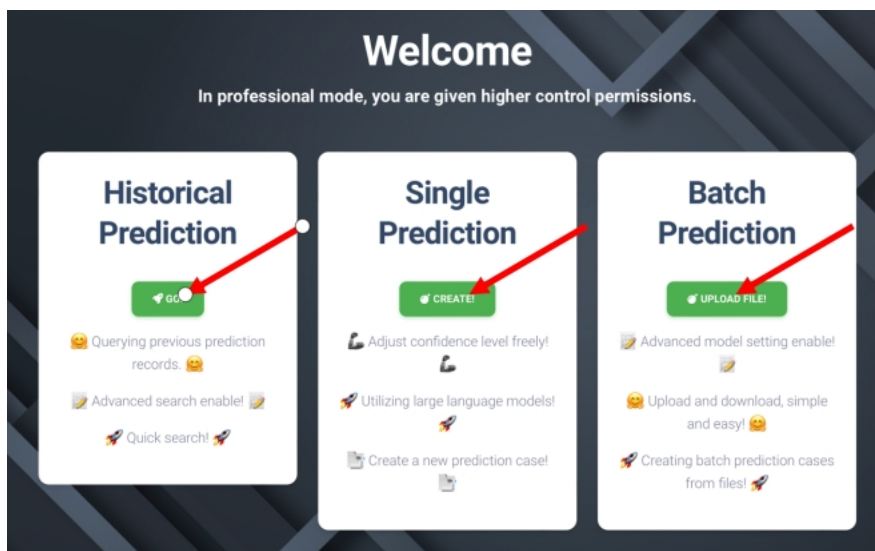

Figure 12: Pro Mode Homepage

4.1 Historical Prediction

On this page, you can use the result ID to find historical records. As Figure 13 shows, enter the result ID and click the button **SEARCH!**.
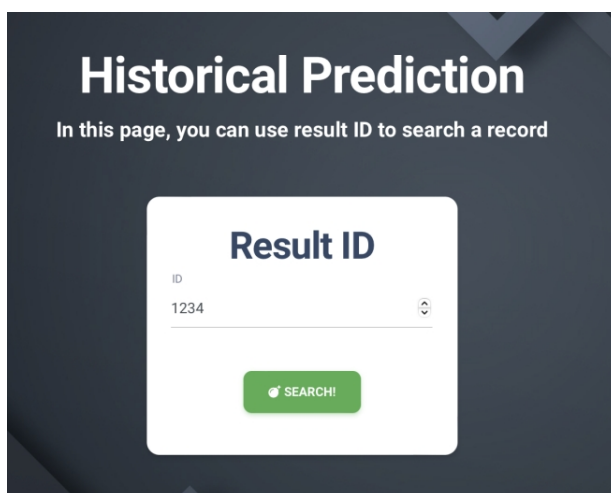

Figure 13: Historical Prediction

If your result ID can't find corresponding records, you will be turned to this page like Figure 14.
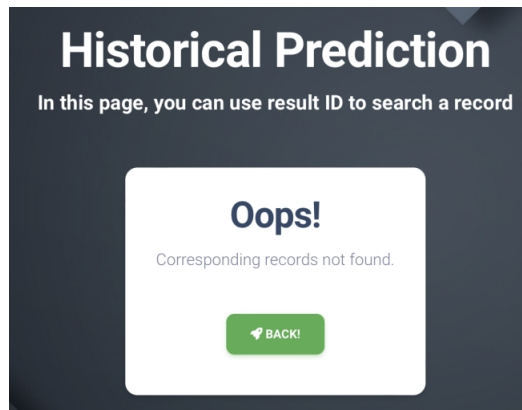
Figure 14: Historical Prediction Error

If your result ID can find corresponding records, the result will be shown (Figure 15).

Figure 15: Historical Prediction Result

4.2 Single Prediction

As Figure 16 shows, we need to enter many parameters. These parameters can be divided into 4 parts: **Location**, **Basic**, **Advance** and **Pro settings**.

4.2.1 Location

- Zipcode: Input the zipcode of the house can improve accuracy of the search. It is helpful to narrow down the search. E.p. 98001.

- Lat: Input the latitude of the house. E.p. -47.

- Long: Input the longitude of the house. E.p. 120.

- Is waterfront?: Whether the house is near the water. Usually, the price of a house by the water is higher. 1 is for yes, 0 is for no. E.p. 1.

4.2.2 Basic

- Bedrooms number: The number of bedrooms in the house. E.p. 2.

- Bathrooms number: The number of bathrooms in the house. E.p. 2.

- Floors: The number of floors. Don't need to mind the basement. E.p. 2.

- Built year: The year of the house when was built. E.p. 2000.

- Renovated year(if not, enter 0): The year of the house when was repaired. If the house was never repaired, enter "0". E.p. 0.

- Living size: This is often used to describe the internal living area of a house, excluding non-residential spaces such as garages, basements, etc. E.p. 1000.

- Lot space: The total area of the house. It includes exterior space such as a garden. E.p. 140.

- Above basement space (in ft square): The total area of the house above ground level. It includes the attic. E.p. 120.

- Basement size: The total area of the basement. If this house don't have the basement, please fill in 0 instead. E.p. 20.

4.2.3 Advance

- View number: You need to input the times this property has been viewed already. If you are not sure, you can enter 0. E.p. 2.

- Condition: You need to enter the score for the condition. E.p. 3.

- Grade: You need to evaluate and give a grade. If you are not sure, you can enter 0. Usually, the grade is not over 13. E.p. 4.

- Living space in 2015 (in ft square): The size of living space in 2015. Usually, it is same as now. E.p. 120.

- Lot space in 2015 (in ft square): The total area of the house in 2015. Usually, it is same as now. E.p. 140.

4.2.4 Pro settings

- Enable LLM: Enable Large Language model to generate descriptions.

- Enable Full Prediction: Choose to do full prediction to predict price.

- Using user-defined confidence levels: Choose this option. You can decide the confidence levels by yourselves. If you choose this option, you need to enter the number of confidence levels.

- Confidence levels: The number of confidence levels. Usually, the larger the number, the more accurate the result.

- Enable Hidden Prediction: Choose to use hidden prediction.

- Select Model Core: Choose core model type. We can choose `Random Forest`, `Xgboost` and `Lightgbm`.

Figure 16: Pro Single

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4.3 Single Prediction Result

The final result by professional mode single will be shown on this page. Just like in Figure 17, you can see the result ID, prediction price, reasons, and statistics.

Figure 17: Single Prediction Result

4.4 Batch Prediction

On this page, you can do batch prediction by uploading files in proper format. As Figure 19, this page can be divided into 2 parts: **Pro settings** and **Select data file**.

4.4.1 Pro settings

Same as above.

4.4.2 Select data file

Click the **BROWSE** to select the data file. And you can see it on the left after choosing. After doing these things, please click the **SUBMIT**. You will get the result if you upload the file in correct format.

Notes: The format supported currently is **.csv** format. Just like the Figure 18.

bedrooms	bathrooms	sqft_living	sqft_lot	floors	waterfront	view	condition	grade	sqft_above	sqft_basement	building_age	renovated_year	lat	long	sqft_living15	sqft_lot15	year	month
3	2.5	2700	8444	2.0	0	0	3	10	2700	0	22	22	47.5597	-122.113	2840	9165	2014	10
5	2.0	3370	5000	1.5	0	0	4	7	2140	1230	107	107	47.6373	-122.35	1920	3200	2014	5
3	2.25	2680	100188	2.0	0	0	4	8	1580	1100	36	36	47.4776	-122.02	2540	60548	2014	7
3	1.5	1500	6337	1.0	0	0	5	7	1500	0	61	61	47.7276	-122.312	1420	6337	2014	5
4	2.5	1950	7350	1.0	0	0	3	7	1150	800	51	51	47.656	-122.134	2050	9068	2014	12
2	1.0	940	8384	1.0	0	0	3	5	940	0	67	67	47.5065	-122.364	1290	8384	2014	8
2	2.0	1140	1118	2.0	0	0	3	7	1040	100	5	5	47.596	-122.311	1140	1118	2014	10
3	2.75	2980	27144	1.5	1	2	5	8	2180	800	97	97	47.4522	-122.378	1890	12514	2014	5
4	3.5	5550	28078	2.0	0	2	4	12	3350	2200	14	14	47.6395	-122.234	2980	19602	2014	5
4	3.75	4030	503989	2.0	0	0	3	10	4030	0	7	7	47.4807	-121.795	2110	71874	2015	5

Figure 18: csv-example

Figure 19: Batch Prediction

If your data file is un-supported format, you will be turned to this page like Figure 20.
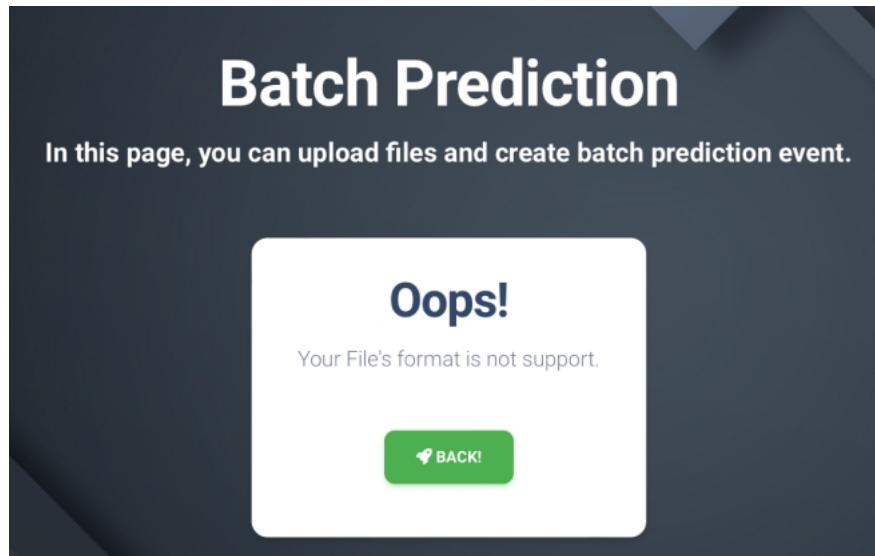

Figure 20: Not Support

4.5 Batch Prediction Result

If you upload a data file with correct format, you can see the result on this page. Just like in Figure 21, you can see the batch prediction result and you can download report for each prediction.

Figure 21: Batch Prediction Result