

Prediction Technique of the Right of View Out

Ki Hoon MOON

¹KSCFC Technology Education Center, Chungbuk, Korea

ABSTRACT

As buildings in urban residential areas are soaring higher, however, various cases of the violation of the right to a view and disputes over it are increasing. In one of the legal disputes of the right to a view, the Seoul High Court measured the size of a South-facing area in which the sky is seen and ruled on the basis of a scale from 0 to 10, 0 being no building is seen within the area, and 10 being buildings obstruct the view of the sky completely. A comparison of the view before a building is constructed with that after a building is completed is one way of evaluating a view, but it accompanies many difficulties and constraints because it is virtually impossible to evaluate a view after the right to a view was violated by a new building. One of the ways to measure the degree to which a view is violated and calculate a view rate is to use a 3-dimensional computer simulation. This essay attempts to suggest a way of evaluating the view from an apartment building using such computer programs as Autodesk VIZ and View program independently developed by Light and Architectural Environment Laboratory and examine the validity of the programs by comparing the simulation results with the measurement of the actual view from an apartment

Keywords: View right, Visual privacy, View out, Apartment Building

1. Foreword

1.1 Background and purpose of the study

Outside views from a building is one of the crucial architectural aspects of urban spaces. With the enhancement of their living standards, people pay more attention to outside views of the building they live in. Open outside views of an apartment have a positive impact on its price.

The increase in the number of high-rise buildings in urban areas has increased the number of cases in which the right to view of those occupants in lower buildings is infringed. Generally, people living in a

building with limited outside views are likely to feel a sense of pressure or even claustrophobia. Thus, there is an increase in the number of disputes concerning the right to open outside views and sunlight.

If outside views of a building have an influence on its value, its owner will naturally pay attention to the possibility of damage to outside views caused by a newly built building next to it.

Recently, courts passed judgments ordering compensation for infringement of the right to outside views ("the infringement") in lawsuits filed by those living in riverside apartments.

There are no established opinions on how to measure the level of the infringement quantitatively and it is very difficult to measure it before the work for the newly built building is completed. Such being the case, a computer-simulated evaluation method is used. The method makes it possible to measure the level of the infringement. However, it may lead to controversies, as there are no criteria established for it, nor how to determine the level of the infringement.

This paper attempts to propose computer-simulated programs for relevant evaluation. An apartment in Namyangju (“the subject apartment, HW apartment”) and a newly built apartment next to it (“the new apartment, SY apartment”) were chosen for the study. The validity of the computer-aided appraisal was checked by comparing it with the real status at the HW apartment.

1.2 Details of the Study

① The current status of the HW apartment was checked and then relevant data, including their design drawings, were used as input data for a 3D model.

② For the simulation program, the Autodesk VIZ 2008 Program and the VIEW Program developed by the team were chosen.

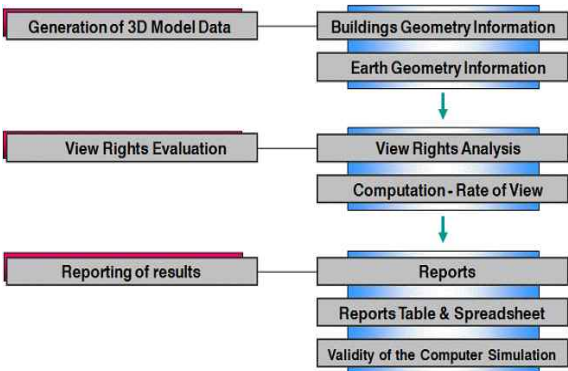


Figure 1: View analysis process

③ 60 units of the HW apartment in two buildings were chosen as those whose right to outside views is expected to be infringed by the newly built apartment (SY). The level of outside views of the HW apartment

before and after the construction of the new apartment was checked.

④ The validity of what was found in the foregoing process was checked by comparing results of the computer-aided simulation with real outside views of the HW apartment.

2. SUMMARY OF THE APARTMENT HOUSING

2.1 Selection

The subject (HW) apartment was comprised of two 16 ~ 27 story buildings. Before construction of the new (SY) apartment (17 ~ 25 story buildings) to its Southeast, views from the HW apartment included the Han River

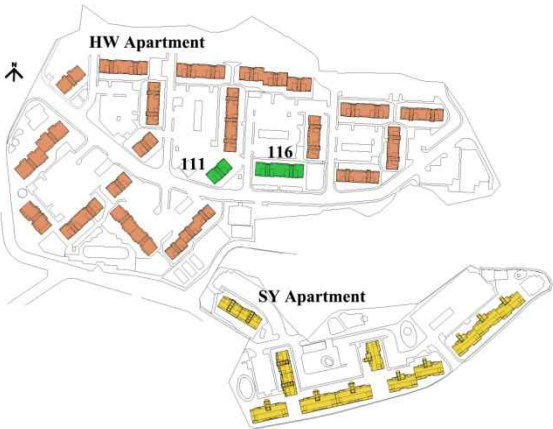


Figure 2: Site Plan



Figure 3: Apartments Isometric

2.2. Facts about the HW Apartment

2.2.1 The subject (HW) apartment

The HW apartment buildings are comprised of 1,488 households in 20 buildings built on 66,824 m² land. A 15 meter-wide road is located to its east and west, respectively. And there is a 10 meter-wide road to its south. The entire complex is located on a slope. Bldg. Nos. 111 (21 stories), 112 (19 or 21 stories), 114 (16 or 21 stories), 116 (21 stories) and 119 (16 stories) are expected to have their open views affected by the newly built apartment. Its entire configuration is shown in Figure-4. Photo.1 and Photo.2 show how views from the HW apartment were before the construction of the new apartment.



Photo 1: A view from Household 2102, the HW apartment Bldg. 111



Figure 4: HW Apartment Buildings

2.2.2 Facts about the Newly Built Apartment (SY)

The newly built apartment is comprised of 7 buildings. Bldg. 101 (17/21/24/25 stories), Bldg. 102 (24/25 stories), Bldg. 103

(21/25 stories), Bldg. 104 (25 stories), Bldg. 105 (25 stories), Bldg. 106 (19/20/24/25 stories) and Bldg. 107 (20/18 stories) are those that affect views from the HW apartment as stated in the foregoing. The entire configuration of the SY apartment is shown in Figure-6.

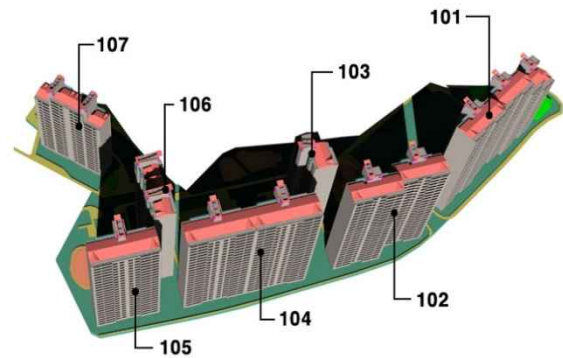


Figure 5: SY Apartment Buildings



Figure 6: SY Apartment Elevation

2.3 Criteria of Views

2.3.1 Law Concerning the Infringement

Supreme Court Judgment 2003Da6302 passed on Sept. 13, 2004 set forth the requirements that land or building should have for a view benefit by ruling, "If scenery or view that has been enjoyed by the owner of any land or building is objectively acknowledged to have a value as a living benefit, it can be an object of legal protection. Such a view benefit should not be an object of legal protection, unless it is acknowledged that a specific place has in principle a special value in viewing outside, and the view benefit that the owner or occupant of the building is enjoying from

the building has such an importance as to be acknowledged as a socially accepted idea as in the case that the building was constructed in the place with an important purpose of enjoying such a view benefit.”

2.3.2 Measurement of the Extent of the Infringement

There are methods to measure the extent of the infringement.

The rate of unobstructed views is set within a range of 0 to 100 percent. When the rate of unobstructed views is measured to be 0 ~ 20 percent or 30 ~ 50 percent, it is regarded as “slightly obstructed” or “seriously obstructed,” respectively. ²⁾

The “rate of obstructed outside views” is measured based on a 170 cm-tall person seated at the center of the living room of an apartment casting a glance outward horizontally, with his/her views obstructed due to a newly built structure. (The Seoul District Court’s ruling on April 29, 2003.)

2.3.3 Acceptable Limits of the Infringement

A court’s judgment says that the infringement with up to 60 percent of outside views from a building obstructed is regarded as within an acceptable limit and thus not illegal (Seoul Appellate Court’s judgment made on July 7, 2000).

Another judgment of a court says that a new building’s complete obstruction of views from an existing apartment (specifically, from the center of the living room or a main bedroom) constitutes a case exceeding acceptable limits and should be regarded as the infringement (Jinju Branch Court’s judgment made on November 26, 1999).

Another judgment of a court says that if the percentage of obstructed views of the sky from the living room of an apartment exceeds a certain level it should be regarded as exceeding an acceptable level (Seoul Appellate Court’s judgment made on March 29, 1996).

3. EVALUATION METHODS OF UNOBSTRUCTED VIEWS FROM A BUILDING

3.1 Selection of Views-Related Simulation Program

For a program to establish a 3D model, the AutoCAD Program used in the architectural design area was selected. The AutoCAD Program makes it possible to set a solid model and enter measurements related to real buildings. For production of view images, the Autodesk VIZ 2008 Program was selected. It is compatible with the AutoCAD Program, in addition to being equipped with various devices for camera adjustment.

For calculations of the size of views based on the view images produced using the Autodesk VIZ Program, the VIEW Program developed by the Light and Architectural Environment Laboratory, Kyunghee University was used.

The VIEW Program was made to display the number of pixels of specific colors of images in relative percentages. The percentage of unobstructed views of the sky can be obtained by marking the sky portion in white in the process of making view images, using the Autodesk VIZ Program.

The Program was made, using Bitmap functions in Visual Basic. Space ratios were marked by screening out the whites on the monitor base at a resolution of 1024x768.

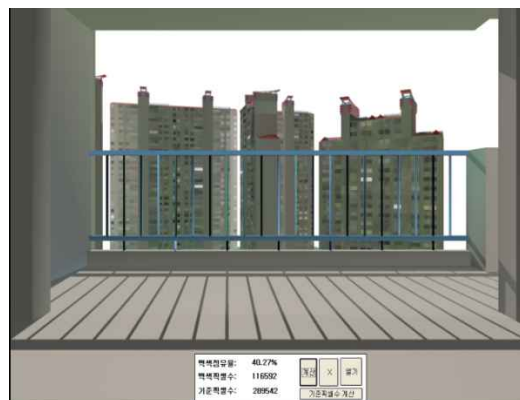


Figure 7: VIEW Program

3.2 Evaluation Methods of the HW Apartment

3.2.1 Input of Building-Related Materials

A 3D model was made, using the AutoCAD Program, after checking to see the conformity between drawings and the real on-site situations. The bearings and the location of the site were checked based on the map provided by the National Geographic Information Institute.

3.2.2 Analysis of Views

Analysis of views was made on the basis of the rate of unobstructed views from the living room of each household comprising the HW apartment. For the rate of unobstructed views, a simulation was made, using a computer, on the supposition that a 170 cm-tall person looks out, seated at the center of the living room of each household of the HW apartment (with that person's eye level being 90 cm from the floor), with/without the new apartment included.

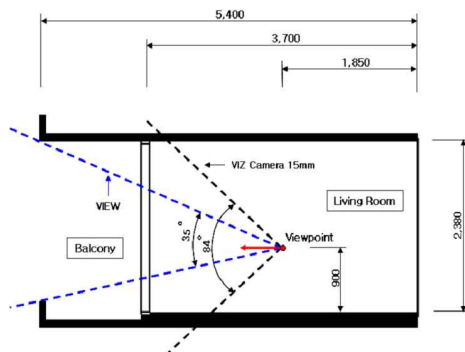


Figure 8: Section

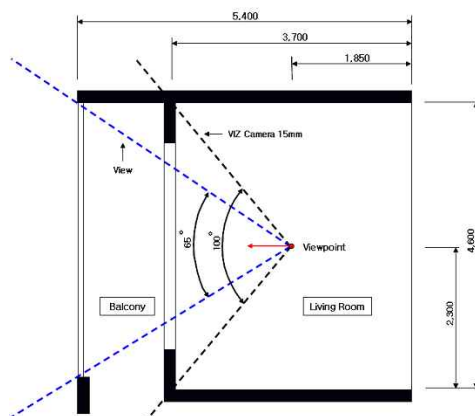


Figure 9: Plan

4. EVALUATION OF VIEWS

4.1 Details of View Evaluation

The rate of unobstructed views was calculated by excluding the portion of the views obstructed by the new apartment. Nearby mountains were regarded as part of the unobstructed views. Thus, the following factors were calculated: the entire size of the living room windows of each household, the rates of unobstructed views before/after the construction of the new apartment (%), and the percentage of the portion of views obstructed by the new apartment.

4.2 Calculation of Unobstructed View, Using the VIEW Program

The VIEW Program was made to calculate the rate of unobstructed views, using the view images made from the Autodesk VIZ Program. The Autodesk VIZ Program makes it possible to adjust background colors. Accordingly, the colors of objects viewed through the living room windows inside the 3D model were fixed optionally to use them as the space of unobstructed views.

For the rate of unobstructed views, the number of pixels of the benchmark views should be set. In this study, the number of entire white pixels for objects viewed through the living room windows was set at 100 percent.

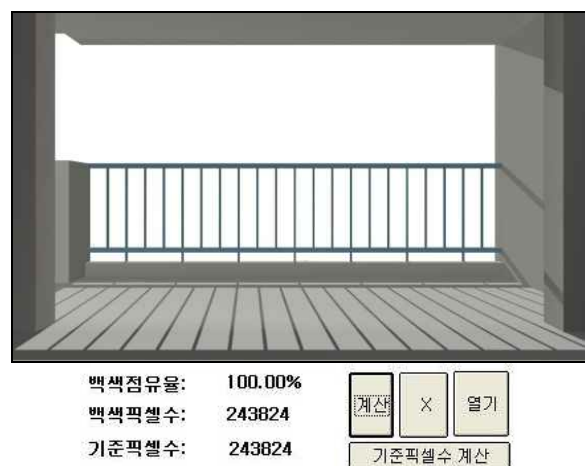


Figure 10: Reference View of HW Apartment House

The rate of unobstructed views from the HW apartment is obtained based on the calculation of the number of white pixels, with the new apartment included, (“the share of the white color”).



Figure 11: View Ratio After New Construction SY Apartment House

For creation of view images, a free camera was used in the Autodesk VIZ Program. Variables were entered as shown in Table 1 after fixing it at the center of the living room. The variables of the adjustable camera lens in the Autodesk VIZ Program do not necessarily correspond to those of the real camera lens. Thus, the phenomena of distortions in the real camera lens may not be found in the Program.

Table 1: Autodesk VIZ Camera Parameters

Items	Input Parameters
Lens	15mm
FOV	↔ 100.389 deg ↑ 83.974 deg
Type	Free Camera
Installation location	Center of living room
Installation height	900mm

4.3 Rate of unobstructed views from the HW apartment

The average rate of unobstructed views from the 24 households of the HW apartment Bldg. 111 stands at 96.5% prior to the construction of the new apartment, compared to 52.7% after the construction of the new apartment, meaning that the HW

apartment will lose its unobstructed views by 43.8% due to the new apartment. In the case of Household 501, its rate of unobstructed views stands at 87.6% prior to the construction of the new apartment, but appears to lose 58.3% of its view after the construction of the new apartment, showing the largest reduction of the rate of unobstructed views among the 24 households in Bldg. 111.

Table 2: The rate of unobstructed views from the HW apartment Bldg. 111 reduced due to the new apartment

Household Nos.	Living room window size (m ²)	The rate of unobstructed views prior to the construction of the new apartment		The rate of unobstructed view after the construction of the new apartment		The rate of unobstructed view reduced due to the new apartment (%)
		The size of unobstructed views (m ²)	The rate of unobstructed views (%)	The size of unobstructed views (m ²)	The rate of unobstructed views (%)	
302	9.98	8.33	83.5	3.35	33.6	49.9
402	9.98	8.47	84.9	3.52	35.3	49.6
501	9.98	8.74	87.6	2.92	29.3	58.3
502	9.98	8.80	88.2	3.85	38.6	49.6
701	9.98	9.15	91.7	3.48	34.9	56.8
902	9.98	9.29	93.1	4.41	44.2	48.9
1001	9.98	9.54	95.6	4.13	41.4	54.2
1002	9.98	9.56	95.8	4.69	47.0	48.8
1102	9.98	9.75	97.7	4.88	48.9	48.8
1202	9.98	9.80	98.2	5.03	50.4	47.8
1302	9.98	9.98	100.0	5.34	53.5	46.5
1401	9.98	9.98	100.0	5.18	51.9	48.1
1402	9.98	9.98	100.0	5.43	54.4	45.6
1501	9.98	9.98	100.0	5.37	53.8	46.2
1502	9.98	9.98	100.0	5.63	56.4	43.6
1601	10.85	10.85	100.0	6.49	59.8	40.2
1702	10.85	10.85	100.0	6.81	62.8	37.2
1802	10.85	10.85	100.0	7.03	64.8	35.2
1901	10.85	10.85	100.0	7.11	65.5	34.5
1902	10.85	10.85	100.0	7.19	66.3	33.7
2001	10.85	10.85	100.0	7.26	66.9	33.1
2002	10.85	10.85	100.0	7.44	68.6	31.4
2101	10.85	10.85	100.0	7.35	67.7	32.3
2102	9.98	9.98	100.0	6.81	68.2	31.8

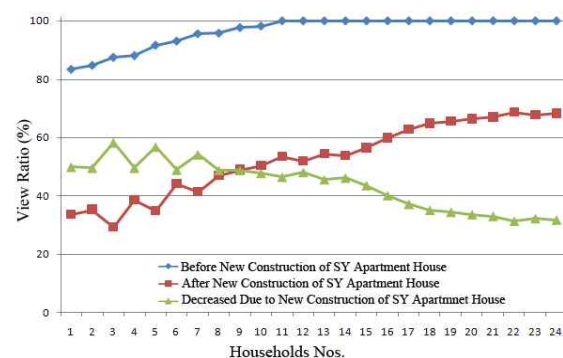


Figure 12: Comparison of view ratios (Bldg.111)

As for the 36 households in Bldg. 116, the average rate of unobstructed views from them stands at 98.5% prior to the construction of the new apartment, compared to 54.4% after the construction, meaning that the HW apartment will lose 44.1% of its view due to the new apartment.

Table 3: The rate of unobstructed views from the HW apartment Bldg. 116 reduced due to the new apartment

Household Nos.	Living room window size (m ²)	The rate of unobstructed views prior to the construction of the new apartment		The rate of unobstructed view after the construction of the new apartment		The rate of unobstructed view reduced due to the new apartment (%)
		The size of unobstructed views (m ²)	The rate of unobstructed views (%)	The size of unobstructed views (m ²)	The rate of unobstructed views (%)	
102	9.98	7.91	79.3	1.85	18.5	60.7
402	9.98	9.01	90.3	2.80	28.1	62.2
502	9.98	9.33	93.5	3.15	31.6	61.9
503	9.98	9.29	93.1	3.12	31.3	61.8
505	9.98	9.34	93.6	1.70	17.0	76.6
801	9.98	9.76	97.8	4.68	46.9	50.9
905	9.98	9.90	99.2	2.83	28.4	70.8
1005	9.98	9.98	100.0	3.12	31.3	68.7
1101	9.98	9.98	100.0	5.59	56.0	44.0
1102	9.98	9.98	100.0	4.65	46.6	53.4
1105	9.98	9.98	100.0	3.33	33.4	66.6
1201	9.98	9.98	100.0	5.83	58.4	41.6
1202	9.98	9.98	100.0	4.90	49.1	50.9
1302	9.98	9.98	100.0	5.10	51.1	48.9
1401	9.98	9.98	100.0	6.29	63.0	37.0
1402	9.98	9.98	100.0	5.26	52.7	47.3
1403	9.98	9.98	100.0	5.48	54.9	45.1
1405	9.98	9.98	100.0	4.30	43.1	56.9
1501	9.98	9.98	100.0	6.53	65.4	34.6
1605	10.85	10.85	100.0	5.81	53.5	46.5
1702	10.85	10.85	100.0	6.86	63.2	36.8
1703	10.85	10.85	100.0	6.86	63.2	36.8
1705	10.85	10.85	100.0	6.20	57.1	42.9
1802	10.85	10.85	100.0	7.00	64.5	35.5
1805	10.85	10.85	100.0	6.56	60.5	39.5
1901	10.85	10.85	100.0	8.38	77.2	22.8
1902	10.85	10.85	100.0	7.29	67.2	32.8
1903	10.85	10.85	100.0	7.66	70.6	29.4
1905	10.85	10.85	100.0	7.00	64.5	35.5
2001	10.85	10.85	100.0	8.66	79.8	20.2
2003	10.85	10.85	100.0	7.93	73.1	26.9
2005	10.85	10.85	100.0	7.25	66.8	33.2
2101	9.98	9.98	100.0	8.03	80.5	19.5
2102	9.98	9.98	100.0	6.90	69.1	30.9
2103	9.98	9.98	100.0	7.32	73.3	26.7
2105	9.98	9.98	100.0	6.70	67.1	32.9

In the case of Household 1005, its rate of unobstructed views stands at 100% prior to

the construction of the newly built apartment, but appears to lose its view by 68.7% after the construction, showing the largest reduction of the rate of unobstructed views among the 36 households in Bldg. 116.

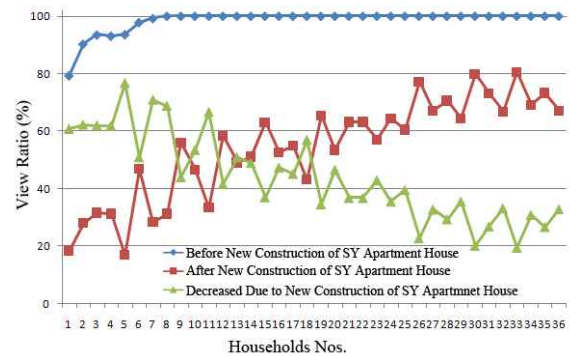


Figure 13: Comparison of view ratios (Bldg.116)

5. VALIDITY VERIFICATION OF COMPUTER SIMULATION

To verify the validity of simulation results, the actual view photograph (JS Apartment Housing of Yongin City, Gyeonggi-do) of the apartment house and the view photograph of the simulated image were compared. The program cannot be said to be usable for view evaluation unless the image of the view as seen by using the camera of Autodesk VIZ program is identical to the photograph actually taken on the same floor and same location.



Photo 3: View picture

The image in Fig. 14 is a simulation of the view ratio as seen from the same place

and at the same time of the picture-taking, to verify validity.

Comparison between the view of the actual photograph and the view of the simulation image showed that the locations of Apartment House and the ridge of the hill match each other.

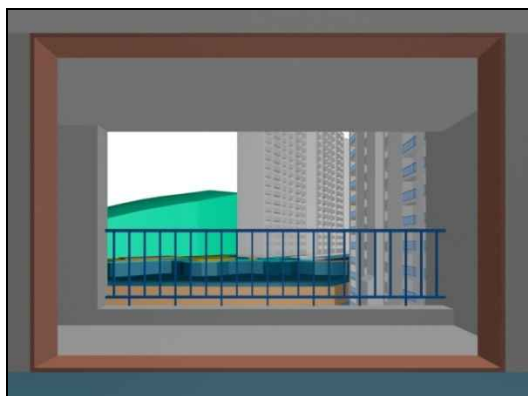


Figure 14: View Image

6. CONCLUSION

This study attempts to present evaluation methods of outside views of apartments, using graphic programs, with a hope to be used as a basic material for similar attempts made in the future.

1) The AutoCAD Program was used to set a simulation model for view-related appraisals, as the Program makes it possible to enter accurate measurements. The Solid model used in setting the 3D model is compatible with the Autodesk VIZ Program, which made it easy to carry out the relevant simulation.

2) It appears that the view images that were made, using the camera function of the Autodesk VIZ Program, show a high level of accuracy. It was found that the level of understanding of how much outside views of each household are obstructed could be enhanced by expressing them in the form of realistic images before/after the construction of the new apartment, using the 3D model.

3) For calculation of the rate of unobstructed views based on Bitmap images,

it is required to use a program that can make a calculation of the unobstructed portion of the views. Thus, the VIEW Program was developed for the calculation, thereby improving the possibility of errors in the process of measuring the size of the unobstructed portion and reducing the time required for the calculation. The study obtained the percentage of unobstructed views reduced by the new apartment by comparing the percentage prior to the construction of the new apartment with that after the construction.

4) The view images made by the Program for the same point on the same floor were compared with their real photos, which showed the consistency between them.

5) It appears that it is possible to appraise outside views from a building, using the 3D model and view images, regardless of the various forms.

This study attempts to present methods of appraising the rate of unobstructed views from a building, using view images. The court has made judgments on the cases involving the infringements, showing that criteria for relevant judgments are being established. Under such circumstances, it is thought that there is a need to develop simulation techniques that can help make relevant judgments and reduce the time for simulations.

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