# Modeling of In-Between Spaces in vernacular houses of East Gilan

INTBAU Iran  Feb 2023

Mahdiye Mirmiran, Ali Asghar Malek Fazli,Leila Karimi Fard

# Modeling of In-Between Spaces in vernacular houses of East Gilan

**Abstract**

In-Between Space is the interface that between the other two spaces, connects them and makes them accessible or visible. Vernacular houses in East Gilan are divided into four categories: coastal, plain, foothill and mountains based on their location in the middle climates. The aim of this study is to explain the patterns for In-Between space in the vernacular houses of the coastal and foothills of East Gilan. This explanation can show special patterns of spatial organization in these houses; and clarify the role that In-Between spaces have played in establishing accessibility and visibility relationships. The research hypothesis is that In-Between spaces have played a fundamental role in the spatial organization vernaculars houses. This research is of interpretive-historical study type since it deals with discovery and expression of relations between some of houses in the past time. In this regard, first of all, a number of native houses have been selected by purposeful non-random sampling method and the spatial patterns and spatial organization of the In-Between spaces in them have been identified with a qualitative and analytical approach. Then, with an analytical approach, similar features and their common patterns in the number of samples have been obtained, and in the final step, the position of in between space in the optimal spatial organization patterns in these areas have been identified and explained. The results show that veranda and stair were the most widely used types of In-Between spaces in houses in these areas; Meanwhile, the south veranda, in addition to having a special physical shape and features, have played an important role in the accessibility and visibility between the rooms of the house and the hall with the outside space, while the north veranda has not been observed in the samples. Stairs were also widely used in connecting the outside-inside and inside-inside in the houses of these areas, and in two-story houses, in all cases, the stairs have direct access to the veranda.

**Key words:** Spatial pattern, spatial organization pattern, In-Between space, vernacular houses of Gilan.

## Introduction and problem statement

This research is about In-Between spaces (intermediaries) in native buildings. In-Between space are spaces and components of the building that fulfill the two functions of accessibility and visibility between inside and outside. In-Between spaces are sometimes building details; and sometimes a space with the ability to move in them. Therefore, all In-Between spaces, such as counters, porches, corridors, doorways, foyers, vestibules, and the like, and all components such as gates, openings, windows, and the like are among the In-Between spaces (Mirmiran, Malekafazli and Karimifard, 1399, 119). In-Between spaces are less considered in architecture and design than the main spaces; and more or less after dealing with the main spaces. This is while the genealogy and the study of the background of the frequent use of In-Between spaces in the past architecture show their efficiency in providing psychological comfort to the residents; and it shows that peace in the interior space is achieved by using In-Between spaces with special physical and spatial features in the house. Indigenous architecture is a branch of architecture based on regional

needs and building materials that reflects regional traditions. Indigenous architecture has evolved over time based on its environmental, cultural, technological and historical background. The vernacular buildings of Gilan have been designed according to the climatic conditions and to respond to the most desirable human conditions. Rural house is the result of complex cultural, social and geographical factors that manifest themselves in the space and body of the house and the interaction of man, environment and building emerges in it. Factors such as environment, individual and social characteristics, economic status and livelihoods and cultural beliefs play a key role in shaping the structure of space in a rural home (Elahi, 1390,14). In fact, architectural patterns should be appropriate to the specific conditions of each region and make life easier for the people of that place (Khakpour, 1390, 231). In the vernacular houses of Gilan, prominent examples of spatial organization of the house can be found, which in a special way, have met the spatial needs in a special climate, with a special culture. Although most of the surviving examples of traditional architecture in Iran are introverted buildings, in Gilan, more traditional examples of extroverted architecture can be found. This model of organization, by rationally using the In-Between spaces to make the spaces of the house available and visible to each other, as well as the connection inside and outside the building, has obtained efficient solutions (Beheshti, 1386, 121). In order to achieve the desired comfort conditions in Gilan province with its climatic characteristics, it is necessary to use special In-Between spaces and borders for optimal communication inside and outside the home space. This need is not properly answered in the architecture of today's houses in Gilan; And for some reason, the use of In-Between spaces in today's homes has decreased. This research tries to recognize the In-Between spaces derived from the native architecture of Gilan, to use their efficiency for the inhabitants of contemporary houses; and achieve patterns and criteria for efficient In-Between spaces that can provide more favorable physical-spatial and psychological conditions in today's home. Therefore, this study seeks answers to the following questions:

1. What types of In-Between space spatial patterns are present in the native houses of East Gilan?
2. What are the characteristics of the spatial patterns of these In-Between spaces in the vernacular houses of Gilan's plan?
3. What is the position of In-Between spaces in the spatial organization model of Gilan vernacular houses?
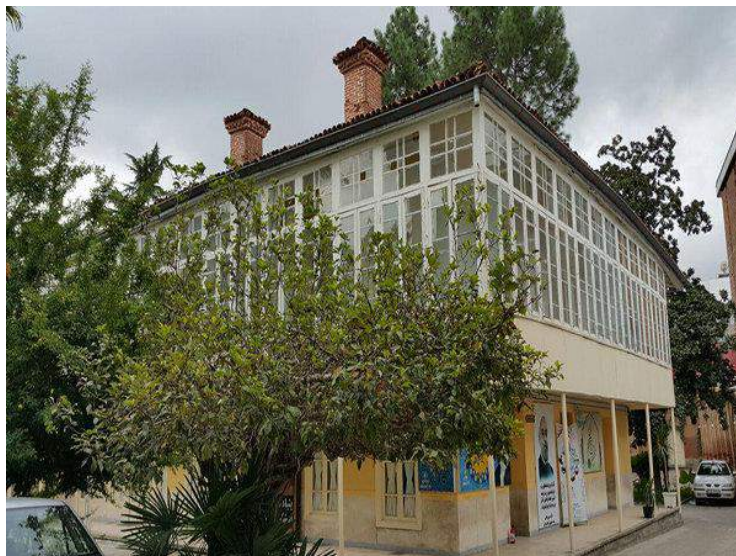
**Research history**

In recent decades, with the replacement of modern apartments with native homes, changes in functional features, spatial and perceptual architecture of the house and residential environments has occurred. The result of these changes has been the elimination of the interconnection spaces between outside and inside in residential units, the distortion of the hierarchy of social relations, and the emergence of emotional turmoil in terms of the structure and appearance of the city and the continuity of residential textures. As users are not mentally prepared to face the experience of a space after the previous space, such as outside and inside space (Nasiri, 1388, 38). So far, research in the field of native architecture of Gilan has been done with different approaches. Some have paid attention to the solutions of building native architecture in design. For example, Shokouhi Rad (1384) considers the native architecture of Gilan as organic architecture and deals with its construction solutions based on nature. Yaran and Gorji Mahlabani (1389) and Mofidi Shemirani et al. (1396) have listed sustainable solutions in Gilan native housing. Also, Mozhgan Khakpour has dealt with the features and principles of indigenous architectural structures in these areas in articles entitled Construction of Shekili Houses in Gilan (1384) and vernacular Housing in Rural Communities of Gilan (1385). Others like Mehrdoust et al. (1399) have pointed to the role of indigenous materials in architecture from the perspective of social sustainability.

Application of patterns and refinement in the features of native architecture of Gilan has been followed by researchers such as Delsha et al. (1397); Khakpour
And Katib (1398), but still the general characteristics of the architectural elements have been addressed and the pattern of In-Between spaces in the native architecture of these areas has not been considered.

In the meantime, some researchers have compared the native architecture of Gilan with the common styles in Western architecture and have examined the extent to which their principles are compatible with the native architecture of these areas; among them, we can mention Raies Samiei et al. (1398) Yaran and Mehranfar(1394).

Attention to climatic and socio-cultural characteristics in the Gilan region is also one of the issues that have been addressed in extensive articles. Mehrdad(1399), for example, has studied the role of climate, culture and nature in the architecture of Gilan's native houses;
Khakpour et al. (1394), Sheikh Mehdi and Khakpour(1390) and Eshghi Sanati and Khakpour(1393) have also studied the impact of culture and social change on rural housing in Gilan.

Therefore, the main difference between this article and other researches is that this article seeks to analyze the special space, i.e. the In-Between space in the native houses (plains-foothills) of East Gilan to identify their common features; and by analyzing the similarities in this space to provide suitable models for it in contemporary house architecture.

**Research Method**
The research method of the article is interpretive-historical; because it explores and explains the In-Between space relationships of a number of houses in the past. The strategy governing research is analysis and interpretation. The data collection step is obtained by purposeful non-random sampling method through the recognition of the In-Between space in the vernacular houses of the plains and foothills of East Gilan and in the step of judging and evaluating the data, the common quantitative and qualitative characteristics of the In-Between spaces are obtained. It is followed in the form of a spatial model for widely used media with an analytical approach and inductive reasoning. The path or steps taken based on this method are as follows:
1: Explain the theoretical framework of research with an analytical approach and citing library studies.
2: Selection of 34 case samples by purposeful non-random sampling and by documentary method, field observation and harvesting.
3: Identifying the In-Between space in the samples and describing them in two physical and functional-spatial ranges
4: Analysis and evaluation of the In-Between space and logical analogy of each type of In-Between spaces obtained in the samples
5: Explanation and modeling of the In-Between space based on the obtained analyzes and final conclusions.

## Fundamentals and theoretical framework

### A- In-Between space typology in the vernacular houses of Gilan

Houses have different components, elements and spaces that are designed based on the type of location in a particular climate, the social status of the owner and the needs of its residents and cultural, religious and economic characteristics. Due to the fact that the predominant shape of Gilan houses is extroverted, the way of communication inside and outside in these houses has had an effective role on the organization of spaces. Also, due to being extroverted and using natural ventilation, most houses have an east-west stretch in the plan and there are intermediate spaces for connecting the main spaces with each other inside the houses. In the studies that have been done on the introduction of In-Between spaces in general, it is possible to identify three categories of In-Between spaces in the vernacular houses of Gilan, considering the location of the In-Between space between the inner and outer areas (table 1).

**Table 1: Types of In-Between spaces in architecture. Source: Authors.**

| Row | Explanation | Example |
|---|---|---|
| 1 | Connecting the open space inside to Outside it and public passage | Vegetation, hedge, front yard, side yards, backyard. The corridor or vestibule that connects the mezzanine (the central courtyard) to the entrance or porch, and the vestibule. |
| 2 | Connecting the indoor space inside to the open space inside or outside it. | Porch, belvedere (open porch), window, door-window, lattice, scuttle, sash, canopy, balcony (porch on the upper floors) |
| 3 | Connecting two closed and indoor spaces | Meander after the entrance, podium (porch entering the room from the mezzanine), the small hallway, or the corridor that leads to the rooms. |

The main focus of this article is on the In-Between space as a space with the ability to move and access, which is the inside-outside and inside-inside interface. In-Between spaces such as porch, stairs, vestibule, corridor, foyer, meander after arrival, counter and belvedere have been seen in the studied examples, each of which is defined:

1. Porch: Indoor and semi-open space, with a floor higher than its surroundings, which is located in the middle of the outside and inside of the space. Its walls can be open or closed on three sides. It is mostly on the ground floor: and if it is on the upper floors, it is called Balkan (Rafiei et al, 1382, 31).

2. Counter (front + house): Indoor and semi-open space in front of the house, which can be open from one, two or all three sides. In most houses, its floor is one or more steps higher than the floor. Its area can vary depending on the location (main or secondary) and the building style. Its appearance is also different in different ways; and it has organs such as pillars, piers, various canopies, and with different heights.

3. Belvedere (terrace): Open porch or balcony (without roof), which has access to the counter, or other porch or rooms of the house. On the ground floor, it is separated by a higher floor.

4. Meander after arrival: Indoor space, which can be accessed after passing through the front of the house, and then the entrance threshold (hall). The function of the vestibule is to separate the inside and outside of the house, and to separate the various accesses in two or more directions. It is varied in form, height and area (Haman, 201). In traditional houses, it has always had spatial independence and has a specific floor geometry form. Such as squares, rectangular squares, octagons, and even circles.

5. Corridor: Sometimes, instead of a vestibule, a narrow space with a limited area separates the door from the interior. The corridor is for passage only and can lead to one or more rooms.
6. Foyer: A space in the middle of two or more spaces that can have several functions, in addition to passing. Sometimes on other floors it is located in the middle of two or more rooms. The foyer is a hall in the middle of the rooms of the building, to which more or less other main and secondary spaces have access; and prevents direct visibility to the rooms. Its area can be small to large.
7. Vestibule: A narrow corridor that connects other rooms and spaces; and it only has a transit function (Dehkhoda, 1377, 322).
8. Stairs: Stairway to access two or more floors. It can be one-slope or multi-slope, and it may or may not have a foot. If the stairs are built in a closed space, it is called a staircase.

## B. Recognize architectural patterns

The word pattern means template, model, idea, shape and sample, template, design, method and role (Shayanfar, 1377:79). Giroucheh believes that the use of model in all sciences is an inevitable necessity; because the human mind does not have the ability to fully comprehend a reality, in its totality and dynamics, so in order to be able to speak of a complex reality and break it down into its components and elements, which are called models (Tavasoli, 1369:163).

**Spatial pattern**

A spatial pattern is a set of physical features (specific shape and size) related to space that give it a special identity. Because such a space is used in many instances over time and in space, it is called a pattern. For example, a dome, a space covered with only one dome, is an example of a spatial pattern that is sometimes used individually and sometimes in combination with other spaces; and they all have a set of identical physical-spatial features (Ranjbar Kermani, 1396, 24).

**Spatial organizing pattern**

A spatial organization pattern arises from the organization and arrangement of two or more spatial patterns together; and important architectural buildings of Iran are identified and registered on this basis. One of the most honorable examples of the spatial organization model in the past architecture of Iran is the four-porch mezzanine, behind each porch of which there is a columned dome or nave, which has been used in many buildings with different uses (Haman, 25).

In this article, an attempt is made to achieve the spatial pattern and spatial organization of the In-Between space in the vernacular houses of East Gilan.

## Findings

Vernacular houses in East Gilan are divided into four categories: coastal, plain, foothill and mountains based on their location in the middle climates. Since the urban area of this climate is mostly located in the coastal to the foothills and also because the plain area in these areas is mainly covered with farms and the share of residential areas is limited, so in the study of native houses The two parts of the coastal and the foothills with a larger share of samples are the criteria.

## 1. Recognition of In-Between spaces in eastern coastal houses

The plain part of East Gilan includes a narrow coastal strip along the Caspian Sea with temperate and humid climate, high humidity, abundant rain and scattered rainfall, etc. Among the existing villages, three villages of Sarmestan, Reza Mahalleh and Dostkuh in the Roodsar central district have been selected from the through purposeful non-random sampling. These houses belong to the temperate and humid climate and the middle coastal (coastal) climate. The criteria for selecting

these villages was the presence of more native houses in them and also the existence of less intrusion and occupation in the structure of houses. Also, these functions have a longer history and antiquity than other coastal villages in these areas. Among these, 6 houses from Sarmestan village, 6 houses from Reza Mahalleh village and 5 houses from Dostkuh village have been selected as case studies for In-Between spaces analysis in houses. Table 2 shows examples of selected coastal houses with their spatial relationships:

**Table 2. Map of coastal houses studied along with their spatial relationships. Source: Authors.**

| Row | House plan | spatial relationships | Row | House plan | spatial relationships |
|---|---|---|---|---|---|
| 1 | | | 2 | | |
| 3 | | | 4 | | |
| 5 | | | 6 | | |
| 7 | | | 8 | | |
| 9 | | | 10 | | |
| 11 | | | 12 | | |
| 13 | | | 14 | | |

| 15 | | | 16 | | |
|---|---|---|---|---|---|
| | | انبار <br> کفش‌خانه / اتاق / اتاق <br> ایوان <br> میاندر / پلکان <br> پلکان | | | اتاق / تالار / اتاق <br> ایوان <br> پلکان / پلکان |
| 17 | | اتاق / دالان <br> ایوان <br> پلکان | | | |

## 2. recognition of In-Between spaces in the houses of the eastern foothills

The foothill areas of East Gilan, especially Rudsar, include the foothills of Eshkevarat Gilan, Amlash city and Rahimabad district of Rudsar, which have less humidity than coastal areas, higher altitude, less scattered rainfall, etc. The sample houses in the foothills have been randomly selected from the two villages of Latak and Torshkouh from Rahimabad district of Rudsar. The vernacular houses of this region follow the physical characteristics of the temperate and humid climate region and according to the previously mentioned criteria, 9 houses from Latak village and 8 houses from Torshkouh section have been selected for In-Between space analysis. Table 3 shows examples of selected foothills with their spatial relationships:

**Table 3. Map of the studied foothills along with their spatial relationships. Source: Authors.**

| Row | House plan | spatial relationships | Row | House plan | spatial relationships |
|---|---|---|---|---|---|
| 1 | | اتاق / اتاق <br> ایوان <br> پلکان | 2 | | اتاق / اتاق / تالار <br> آبریزگاه / ایوان <br> پلکان |
| 3 | | دالان / اتاق / انبار <br> سرسرا | 4 | | تالار / اتاق <br> دودکه / اتاق <br> ایوان <br> پلکان |
| 5 | | اتاق / اتاق <br> پلکان / سرسرا | 6 | | انبار <br> اتاق / اتاق <br> ایوان <br> پلکان |

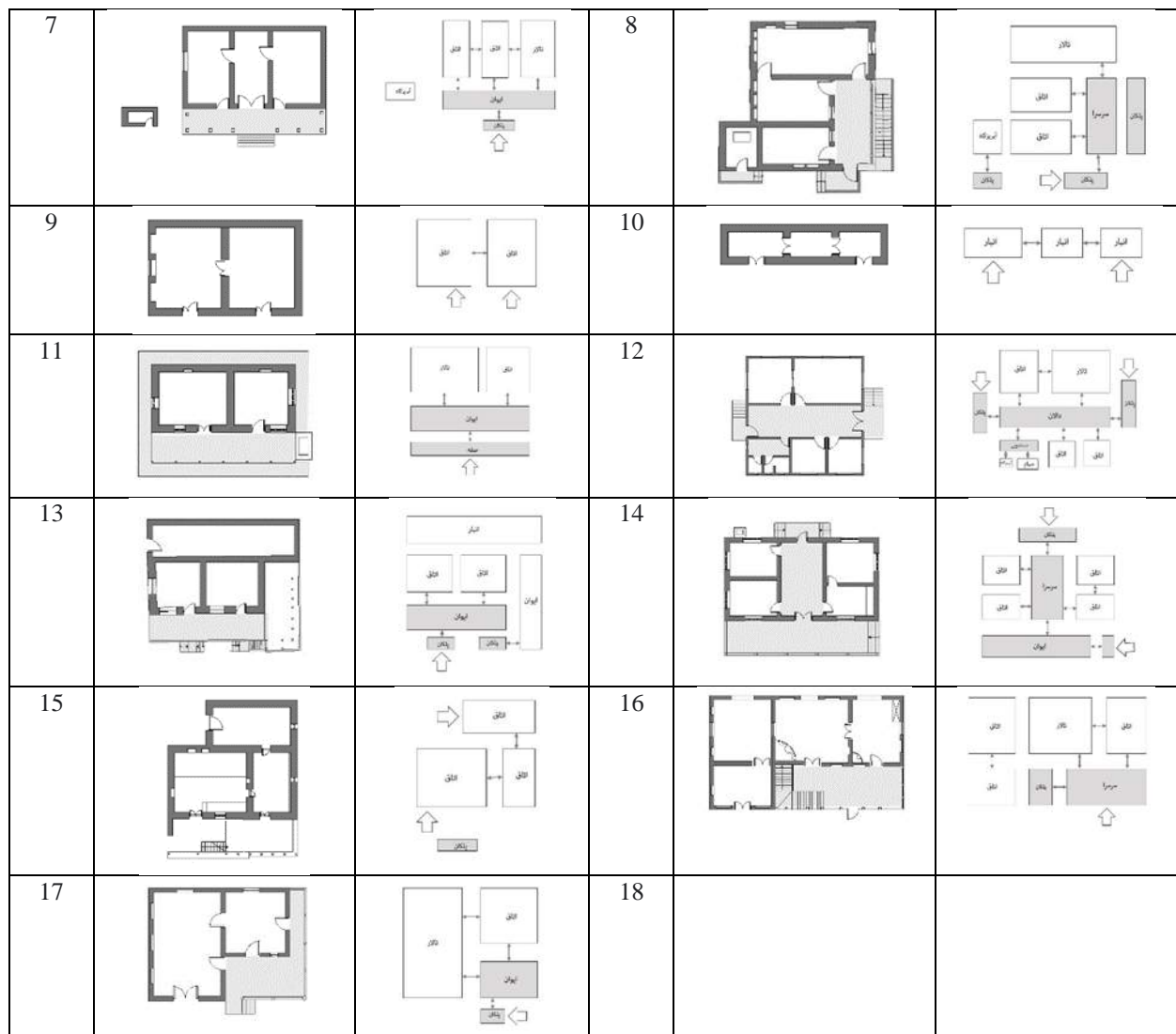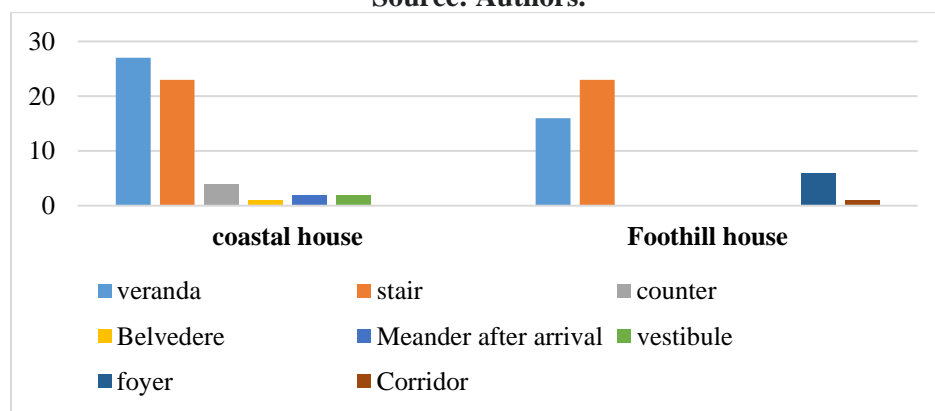| 7 | | | 8 | | |
|---|---|---|---|---|---|
| 9 | | | 10 | | |
| 11 | | | 12 | | |
| 13 | | | 14 | | |
| 15 | | | 16 | | |
| 17 | | | 18 | | |

Chart 1 shows the number and type of In-Between spaces in native coastals and foothills.

**Chart 1 . Diagram of the number and species of In-Between spaces in vernacular coastal houses.
Source: Authors.**



Legend:
- veranda
- stair
- counter
- Belvedere
- Meander after arrival
- vestibule
- foyer
- Corridor

### a.In-Between space analysis in eastern coastal houses

Six species of In-Between spaces seen in the coastal houses of East Gilan:

***Porch, stairs, vestibule, Meander, counter and*** *belvedere.*

Porch and stairs are two In-Between spaces that have been observed in all samples. Among these, the share of the south porch is 100%, meaning that all the houses have a porch on their south side. In houses with more than one porch or L-shaped and U-shaped porches, the share of the eastern porch is 44.4%. This is while the share of West Porch is 14.8%. What is interesting is that the share

of the north porch in these houses is zero percent, i.e. in the coastal houses of these areas, the north side of the house has not been used to create a semi-open space. The porch in these areas is sometimes a rectangle with an east-west extension that is located on the south side of the houses and is an In-Between space that connects the inside and outside of the house and in addition to the access task, it is responsible for protecting the main entrance of the building, i.e. the southern front, from radiation and rain. The width of this porch is large compared to being located in other directions. This shows the different functions of this porch. Sometimes the porch consists of two rectangles that are connected vertically in two different directions and create an L-shaped design. This condition has been observed in 6 of the 27 examples of porches in these houses; That is, a share equal to 22.2%. What is interesting is that all the L-shaped porches cover the south and east fronts of the house. That is, if there is a larger porch in the house after the south, the eastern front of the house is preferable to other areas. The porch of these houses sometimes consists of three rectangles that are perpendicular to each other and have a U-shaped shape. In this case, the porch covers the south, east and west sides. The width of the east and west porches is small compared to the south porch.

Stairs, which are 100% used as porches in houses, show that there is a difference in the level of construction of lowland houses in relation to the floor level. Factors such as preventing moisture from entering the houses, better use of current and air conditioning, proper view and scenery around the building and preventing the entry of natural pollutants into the house can be considered as the reasons for this difference in level. On the other hand, these stairs sometimes connect the two levels of the building. All stairs are one-way and connect the two floors without a step. It seems that the stairs, in addition to the role of access, have been an aesthetic element in the facade of the houses, so that with wooden materials next to the wooden railings of the porches and the eaves of the building, they have given a rhythmic state to the facade of the house. Transparency and spatial fluidity are well visible in the facades of these houses, especially on the southern front. These stairs are designed in complete contrast to the traditional houses in the central regions of Iran. Transparency and availability, location and shelter, as well as the type of materials used can be considered as the main reasons for this discrepancy.

The third In-Between space observed in these houses is the vestibule, which has been seen with a share of 12.5% in two of the seventeen samples studied. The vestibule in these houses is a rectangular, narrow and long space that connects the spaces inside the house. Sometimes it finds an east-west stretch and connects the watershed space to the rooms on the north side of the house, and sometimes it finds a north-south stretch and connects several rooms in the middle of the space. It seems that due to its limited width, its only function is to make the main spaces of the house accessible to each other.

Meander is also an In-Between space that has been seen as a vestibule in two of the seventeen examples mentioned. Meander is sometimes a square that is accessed after passing the stairs and porch and increases the space of the house and sometimes it is a rectangle that connects the main spaces of the house in the middle of the space. Its width is more than the vestibule and less than the foyer, and as its name suggests, it is located in the middle of the spaces and helps to increase the privacy of the space.

Counter and belvedere each have a small share equal to 6.25 percent, i.e. they have been observed in only one sample. In the example seen, the counter is an indoor connection between the living space and the work space at home, and the belvedere is a rectangular platform that connects the two living and working spaces with similar functions but with differences in level.

According to the mentioned analyzes, the two In-Between spaces of the stairs and the porch can be considered as important In-Between spaces in the coastal houses of these areas.





**Also, regarding the position of the In-Between space in the spatial organization of the houses of the coastal of Gilan, the following results were obtained:**
In the coastal houses, the porch has the most connection with the rooms of the house. In other words, in all examples, the porch is directly connected to the rooms of the house, both on the ground floor and on the first floor. If there is a hall or a large guest room in the samples, the direct connection of the porch with it is 100%.the porch is considered as a semi-open space and an interface between outside and inside the house, so the share of its connection with the outside of the house is 100%, which sometimes and in most cases (70.5% of cases) through Entrance stairs This is done and sometimes due to the slope of the ground in some construction points without the need for stairs and is directly related to the outside space. Since most of the plain houses are two-

story (64.7%) and have middle stairs to the first floor, in 88.2% of these two-story houses, the entrance stairs to the first floor are directly connected to the porch. And to access the upper stairs, you have to go through the porch. Also, in 23.5% of the samples, the porch has access to the catchment area and in 11.7% of the samples, i.e. two of the seventeen samples, have a direct connection with the storage and vestibule. Regarding the stairs with an In-Between space role, all of them are connected to the porch and the outside space, and only in one case, the stairs have direct access to the belvedere.

### b. In-Between space analysis in the foothills of East Gilan

Five species of In-Between spaces were identified in foothills:
*Stairs, porches, foyers, counters and corridors.*
Among these, stairs with a share of 88.2% are the most common examples of houses. So that at fifteen Samples of the seventeen samples studied, the stairs were used as inside-outside means. However, the number of one-way stairs in some houses exceeds one and reaches two or three. The existence of stairs as the most widely used In-Between space and interface between inside and outside buildings indicates the existence of a difference in level and construction of the building at a height above ground level. This reinforces the suspicion of moisture and preventing it from entering the building in homes in these areas.

The porch is the second most widely used and important wall in the foothills; 82.3% of the houses in these areas have used it. It is carefully observed in the houses of Tehran that in houses with porches, the share of the south porch is 100%. In other words, all houses with porches have south porches. In houses with two porches or with L-shaped porches, in addition to being located on the south side of the building, the porch also surrounds the east or west side. This is while the share of the north porch is zero percent. In other words, the northern porch was not used in the foothill houses such as the coastal houses in these areas. The porch in the foothills is mostly rectangular with east-west extension and relatively large width in the southern body of the building, which as a semi-open space, is the interface between the space inside and outside the house. On the other hand, in houses with a larger area, the porch often surrounds the southern front of the building, and in houses with a limited area, it often surrounds a part of it, which is mainly located in the middle of the southern front.

The foyer is the third largest in the foothills, with a share of 29.4% in a smaller number of specimens. This foyer is sometimes a space in the middle of the house that connects the main rooms of the house and sometimes it is a space between the outside and inside of the house that has been replaced by a porch on the ground floor. The entrance hall inside the house is mainly north-south and connects the north and south sides of the house with a staircase to the outside of the house. And the foyer outside the house is sometimes L-shaped, occupying the south, east or west side, and sometimes it is located only on the south side of the house.

The counter is the fourth In-Between space in foothill houses that has been observed in only 11.7% of the samples. These counters are seen in houses without stairs and surround the four sides of the house like a narrow row.

The corridor is the last In-Between space in the foothills that has been seen in only one of the seventeen samples studied and does not seem to play much of a role as a wall in the houses of these areas.

Therefore, among the five In-Between spaces observed in the foothills, two stairs and porches, such as coastal houses, are more important than the other mentioned In-Between spaces.

**Also, the following results were obtained regarding the position of the In-Between spaces in the spatial organization of the foothills of Gilan:**

In porch houses in these areas, the porch is 100% connected to the rooms, and if there is a hall or guest house in the house, the porch is directly connected to it. It is carefully observed in the house plans that in the foothills 47% of the samples are two-story and the share of one-story houses is 53%. This means that coastal houses have more area than foothill houses. The share of direct connection of the porch with the entrance stairs of the building is 64.3%, and in other cases, the foothill houses are either located on the ground level or are connected to the outside space through the counter. In two-story houses, the connection between the porch and the upper floor stairs is 62.5%, i.e. in five of the eight examples of two-story houses, the access stairs to the first floor pass through the porch and in the remaining three samples it is accessible directly from outside the building. The share of porch connection with the catchment, storage, counter and foyer is negligible and has been observed in only one case.
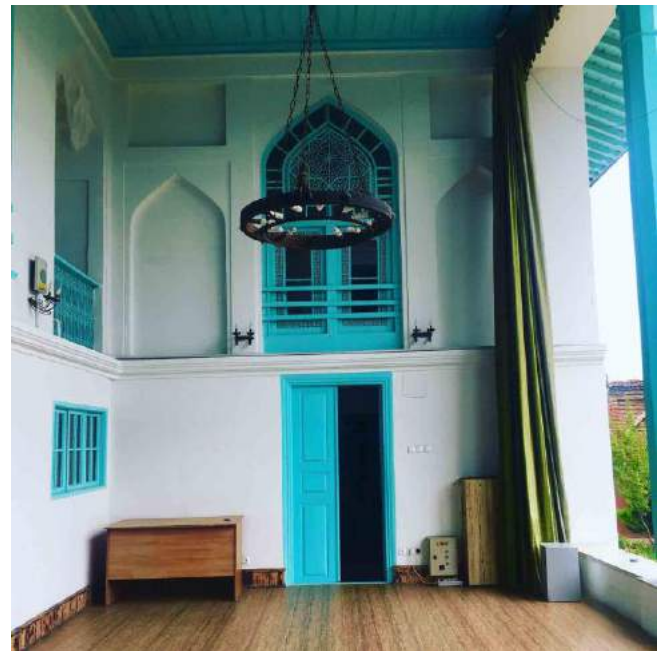


**Discussion and conclusion**

### a. Spatial patterns of vernacular In-Between spaces

Findings show that two species of midgets can be identified in the vernacular houses of East Gilan: porches and stairs. These two In-Between spaces have the highest rate in terms of use in plains and foothills of these areas. That is, although the houses in question are located in two different middle climates, coastal and foothills; But porch still has a share of more than 80% as a semi-open In-Between space in both areas. In order to explain the spatial patterns of these two In-Between spaces in the houses, all the samples were evaluated and the following results were obtained from the analysis of these patterns:

1. Utilization of the south porch in 100% of coastal houses and 82.3% of foothill houses.

2. Using the geometry of a rectangular floor with east-west extension to design a porch in two coastal and foothills.
3. Placement of high width porches on the south front and low width on the east and west fronts of the building.
4. No use of the north porch in plains and foothills.
5. Less width and area of porch in foothill houses than coastal houses.
6. Existence of stairs and level difference in relation to the level of the ground floor in both coastal and foothill houses.
7. There are more two-story houses in the coastal than in the foothills.

**b. The position of the In-Between space in the spatial organization pattern of vernacular houses**

The following results have been obtained regarding the position of the In-Between space in the model of spatial organization of houses:

In coastal and vernacular houses, the share of porch connection with the rooms of the house and the hall, if any, is 100%. Also, due to the difference in level with the ground in the construction of houses in these areas, the porch in more than 70% of cases has a direct connection with the entrance stairs and is the second In-Between space after entering the house. In two-story houses in the coastal and foothills, the connection of the stairs to the first floor with the porches is 100%, which means that to access the first floor, you have to go through the porch. The only difference between coastal and foothill houses in this regard is related to the house catchment. In coastal areas, in 23.5% of the samples, the porch has access to the catchment, while the share of this connection in the foothills is small due to the location of the catchment outside. Figures 2 and 3 show two types of spatial organization patterns for vernacular houses in East Gilan.

**Figure 2. The In-Between space position in the spatial organization model of coastal houses in East Gilan. Source: Authors.**
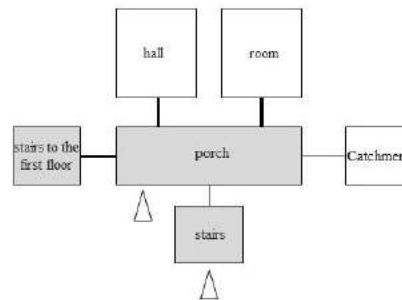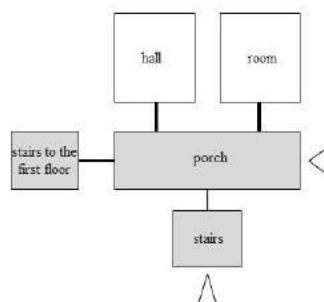


**Figure 3. The position of In-Between space in the spatial organization model of the foothills of East Gilan. Source: Authors.**

---

## References

1. Elahi, Servin. 1390. Gilan traditional architecture: sustainable architecture. First National Conference on Civil Engineering and Development. Rasht: Islamic Azad University.
2. Beheshti, Seyedmohamad. 1386. Iranian house and culture. Abadi Quarterly. 55.
3. Tavasoli, Gholamabas. 1369. Sociological Theories. Tehran: Samt.
4. Khakpour, Mojhgan,Ansari, Mojtaba, Sheikhmahdi, Ali & Tavousi, Mahmood. 1394. Socio-cultural characteristics of indigenous housing. Housing and rural environment. 149.
5. Khakpour, Mojhgan, Eshghisanati, Hesam. 1393. Investigating the effect of social and cultural factors on the physical texture of Gilan villages. Housing and rural environment. 148.
6. Khakpour, Mojhgan, Sheikhmahdi, Ali. 1390. Investigating the effect of culture and social changes on rural housing in Gilan. Journal of Urban Management. Ninth period. 27.
7. Khakpour, Mojhgan. 1385. Construction of shekili houses in Gilan. Journal of Fine Arts. 25.
8. Khakpour, Mojhgan. 1384. Indigenous housing in rural communities of Gilan. Journal of Fine Arts. 22.
9. Khakpour, Minoo, Kateb, Fatemeh. 1398. Accompanying patterns in the architecture of historic houses, case study: Sadeghi House (Lahijan). Armanshahr architecture and urban planning. 29.
10. Delsha, Mahsa, Hoseinpour, Maryam, Vahedi, Somayeh. 1397. Matching the features of Iranian architecture with the native architecture of Gilan (case study: Amlash Sufi House and Ayatollah Boroujerdi House). Architecture. 12.
11. Dehkhoda, Aliakbar. 1377. Dehkhoda Dictionary (Vol. 1). Tehran: University of Tehran.
12. Rafieie sereshki, Bijan, Rafizadeh, Neda, Ranjbarkermani, Alimohamad. 1382. Mehrazi Culture of Iran. Tehran: Publications of the Building and Housing Research Center.
13. Ranjbarkermani, Alimohamad, Maleki, Amir. 1396. Rereading the pattern of the middle space in the architecture of Iran. Bi-Quarterly Journal of Iranian Architectural Studies. 11.
14. Raies samiei, Mohamad mahdi, Amirkiaii, Seyed mahdi, Mofidi shemirani, Seyed majid. 1398. Investigating the degree of conformity of deconstruction principles with the indigenous rural architecture of Gilan. Human settlement planning studies. 17.
15. Shayanfar, Alireza. 1377. Comparative Encyclopedia of Social Sciences. Tehran: Kayhan.
16. Shokouhi Rad, Seyed homayoun. 1384. Gilan native architecture is an example of organic architecture. Quarterly Journal of Housing and Rural Environment. 112.
17. Mofidi shemirani, Seyed majid, Daneshjo, Khosro, Kamran kasmaii, Hadiseh. 1396. Evaluation of indigenous settlements of Gilan on the focus of biosustainability. The role of the world. Seventh year. 2.
18. Merdad, Javad. 1399. The role of climate, culture and nature in the architecture of traditional houses in Gilan province. Architecture. 15.
19. Mehrdoust shahrestani, Mehran, Gholamalizadeh, Hamzeh, Khazaii, Nesa. 1399. The role of indigenous materials in architecture from the perspective of social sustainability (Case study: rural houses in Gilan). New research in geographical sciences, architecture and urban planning. 23.

20. Mirmiran, Seyedehmahdieh, Malekafzali, Aliasghar, Karimifard, Leyla. 1399. Modeling of In Between Spaces in historical houses of Gilan. Quarterly Journal of Housing and Rural Environment. 171.
21. Nasiri, Negar. 1388. A comparative study of the concept of privacy in the Iranian introverted house and the western extrovert house. Journal of Fine Arts. 39.
22. Yaran, Ali, Gorji mahlabani, Yousef. 1389. Sustainable architecture solutions of Gilan along with comparison with Japanese architecture. Journal of Fine Arts. 41.
23. Yaran, Ali, Mehranfar, Aras. 1394. Matching the characteristics of Gilan native housing with modern western architecture. Armanshahr architecture and urban planning. 15.