1. The materials from which the stairs are made have constant mechanical properties and for the same material, the mechanical properties are consistent throughout the stairs.

Changes in the mechanical properties of materials over time or space will lead to increased complexity of analysis and difficulty in accurate modeling. Therefore, assuming that the material properties are constant and consistent can simplify the research process and improve the scientific and operability of the model.

2. The effect of special shoes such as high-heeled shoes on the wear of stairs is not considered in the analysis, and only the role of common soles is investigated.

The wear effect of special shoes such as high-heeled shoes is usually concentrated in localized areas and happens less frequently, which has a modest influence on the overall wear pattern.

3. The data obtained by the simulation expedition in the article is accurate and can truly reflect the wear of stairs and usage patterns.

Assumptions about the data that accurately reflect the wear of stairs and patterns of use will prevent data quality issues from interfering with the study.

4.The study was conducted only on uneven wear of stairs made of stone or wood due to long-term use.

The problem statement explicitly specifies that the study is limited to stone or wooden stairs that show uneven wear after long-term use.

1. All stair users walk at a normal gait (based on the first model, the “Human Gait Model”), and the effects of intentional friction or other abnormal use behaviors on the wear of stairs are not considered.

Assuming that all stair users walk at a normal gait allows the study to focus on regular use and natural wear and tear, thus simplifying the model and avoiding the introduction of unnecessary complexity due to unusual behaviors(such as intentional rubbing or fast running).

Additionally, to simplify the analysis, additional assumptions were introduced and are discussed in the relevant sections.