1. Introduction

As a result of the COVID-19 pandemic, schools and buildings face the problem of social distancing in hallways.

Identify the hallway model that minimizes viral risk by measuring the number of close contacts and the contact time between pedestrians.

2. Methodology

- Python simulation environment¹ tests two pedestrian scenarios: one-way hallway and two-way hallway.
- Tested the parameters:
  - Number of Pedestrians
  - Size of Environment
  - Velocity of Pedestrians
- Data recorded:
  - Number of Close Contacts
  - Average Close Contact Time (sec)

3. Effect of Velocity

<table>
<thead>
<tr>
<th>One-Way Hallway</th>
<th>Two-Way Hallway</th>
</tr>
</thead>
<tbody>
<tr>
<td>V=0.5</td>
<td>V=1</td>
</tr>
</tbody>
</table>

4. Effect of Number of Pedestrians

<table>
<thead>
<tr>
<th>Number of Pedestrians</th>
<th>Asymptotic Avg. Contact Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>5</td>
</tr>
<tr>
<td>150</td>
<td>10</td>
</tr>
<tr>
<td>200</td>
<td>15</td>
</tr>
</tbody>
</table>

5. Effect of Environment Size and Density

- Average contact time stabilizes and asymptotes when density is less than 2 (pedestrians/m²)

6. Conclusion

Benefits of One-Way Hallway Model

- 68.62% lower number of close contacts
- Minimizes risk in narrow or dense hallways
- Moves more people without a significant increase in risk

Source Code