

THE USE OF PATHFINDER AS AN EVACUATION PLANNING TOOL A CASE STUDY IN CONCERT HALLS

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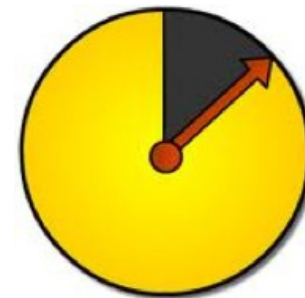
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Summary

- Introduction
- Pathfinder as an Evacuation Planning Tool
- Case Study: Casa da Música
- Sala Suggia
- Sala 2
- Case Study: Coliseu Porto
- Conclusions & Future Work

Introduction

- Egress time => $ASET > RSET$
- Egress time ??
- Fire Drills?



Pathfinder 2016

Agent-based egress simulator:

- SFPE mode (Nelson and Mower, 2002) / Steering mode (Amor et al., 2006)
- Calibration: IMO (International Maritime Organization) tests
- Navigable Mesh
- Behaviors: seek goals; waypoints; exits
- Path planning: locally quickest
- Door choice: minimizing traveling cost

April 2016

Pathfinder Version 2016.1.0229 x64

Case Study: Casa da Música

- International tender under - Porto 2001 European Culture Capital (em 1999) – Winning bid: Arq. Rem Koolhaas OMA
- Construction begun 1999 / Opening April 15th, 2005



Case study: Sala 1 Suggia Casa da Música

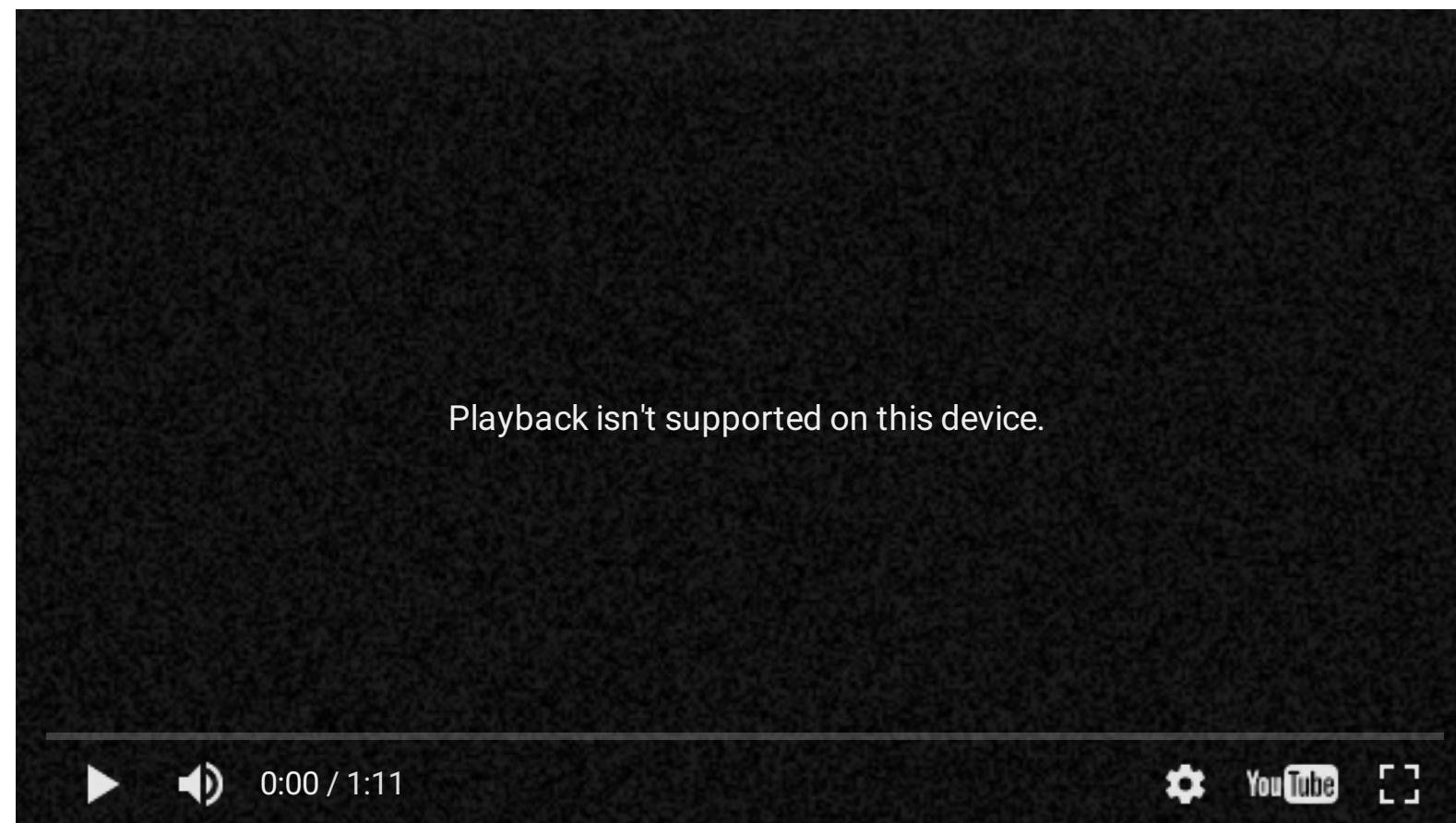


- Main Auditorium, area: 1100 sqm
- Capacity (seats): parterre 1069; Choir 143; Boxes I/II 13

Date	Event	Audience	Real Time	Pathfinder
10.04.2016	NOS Club	1000	04:33	02:42
12.04.2016	Piano concert	738	04:05	01:50
17.04.2016	Classic Orchestra	900	05:55	02:42
16.04.2016	Vozes da radio	1000	07:07	02:21
17.04.2016	Choirs - Voice	638	04:10	01:34

Video CdM Sala Suggia 1036

Suggia_1036_4portas.wmv



Casa da Música: Sala 2



Date	Event	Audience	Real Time	Pathfinder
11.04.2016	Passaro e Fogo	211	04:00	02:42
14.04.2016	Legendary Tiger Man	638	07:47	03:44

Comparison between Real Time and Pathfinder

Case Study 2: Coliseu Porto



- Opened in 1941 (Cassiano Branco et al.)
- Capacity: 3,500 people standing; 2,955 seated
- 1995: after decadence was almost sold to Brazilian Church
- 1996: fire destroyed the stage and partially the main auditorium
- 1998: reopened after 2 years of renovation
- 2014: new Management and new visibility with more concerts and cultural venues

Coliseu Porto: main Auditorium

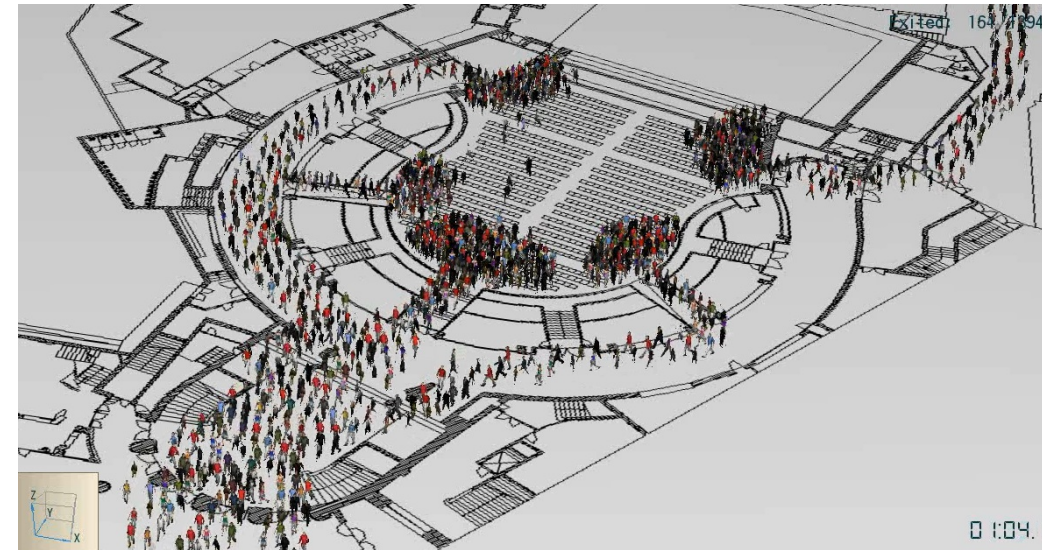
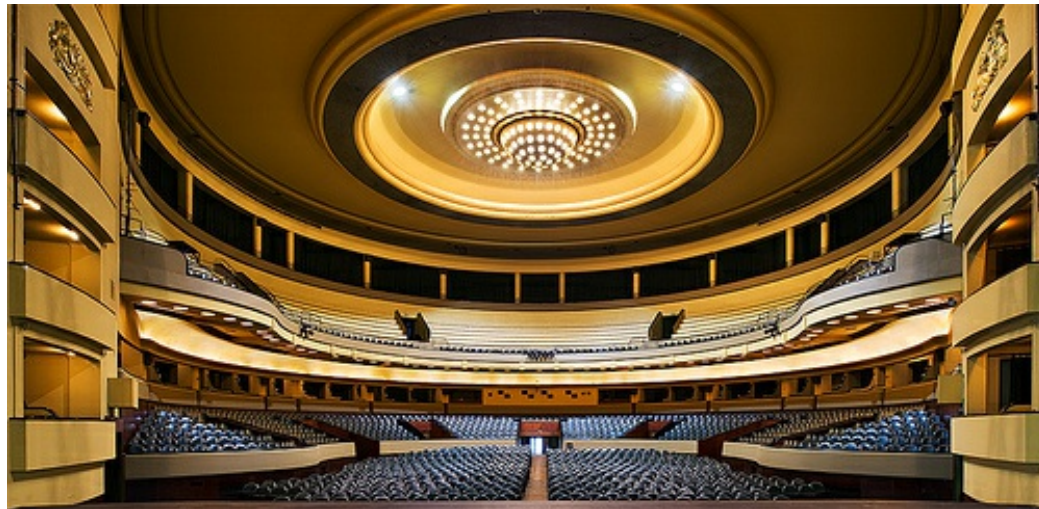


Figure on the right presents a snapshot of the simulation process, showing the Pathfinder 3D view rendering, for the 1,394 standing spectators scenario.

Conclusions & Future Work

Conclusions:

- Valuable Aid (Pathfinder)
- Rapid prototyping
- Results
- Calibration is paramount
- More examples and further scenarios are needed

GIGO Rule: “Garbage In, Garbage Out!”

Acknowledgments

- Casa da Música: Eng^o Paulo Sarmento e Cunha; Eng^o Gilberto Gomes
- Coliseu Porto: Prof.Dr. Eduardo Paz Barroso; Dr. Fernando Pinheiro
- Thunderhead Eng: Mr. Bryan Klein
- LIACC & Univ.Porto