INSTITUTO SUPERIOR TÉCNICO
Universidade Técnica de Lisboa

Geometric Feasibility of ITER Air Cushion Remote Handling Casks and Extensions for Free Roaming Navigation

ERB 5004 CT97 0088-NET/97-460 (EFDA) | 1998

- Partners
  - **Instituto Superior Técnico (IST),** Portugal
- Objectives
  - **Geometric feasibility** of the Air Cushion Cask based on the building layouts
  - **Navigation and Guidance Strategy** for a Flexible (AGV + Free-Roaming) Platform following project ERB 5004 CT 96 0127-NET96-431 (EFDA)
- Geometric feasibility
  - **Path planning** based on optimal methodologies
  - **Area spanned** by the platform when following a specially designed path
  - **Design of smooth paths** in narrow environments
  - **Clearance** required to remove from and insert the platform underneath the cask
  - Recommendations for modifications on **building construction**

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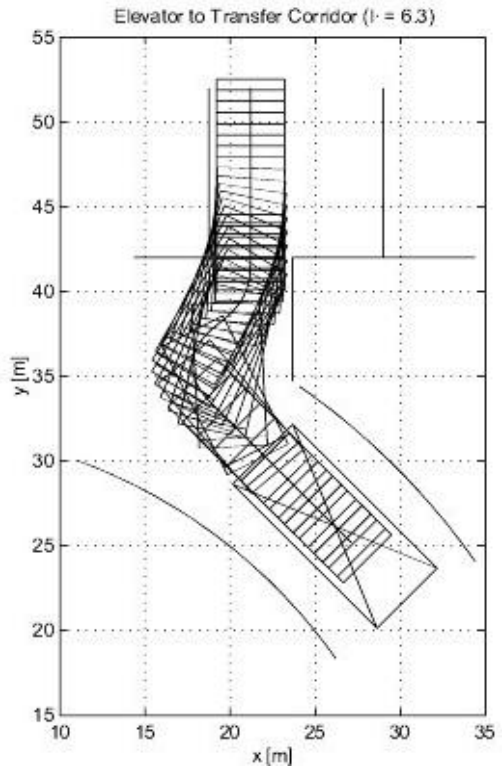
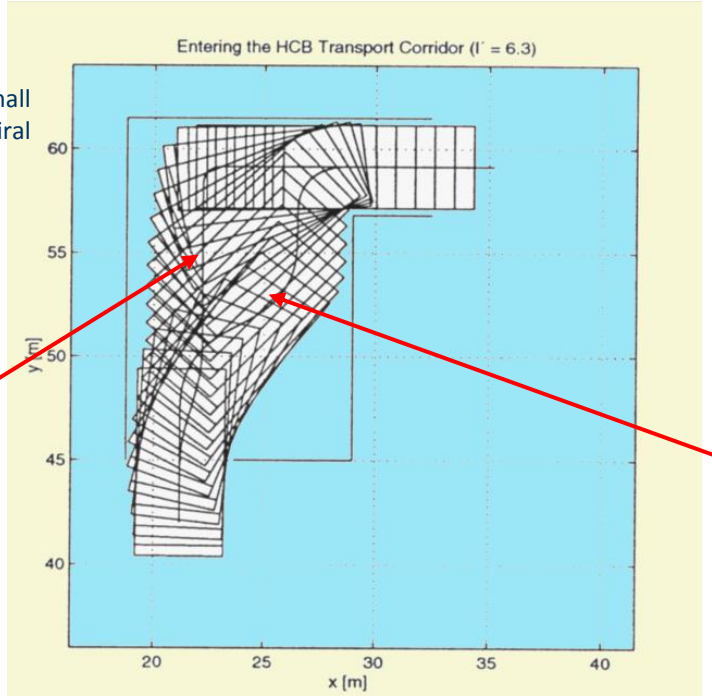
o Geometric Feasibility (cnt)



From lift to VV gallery
Path: Cubic Spiral

From lift to laydown hall
Path: Cubic Spiral



wheels following different paths to fully explore the rhombic configuration

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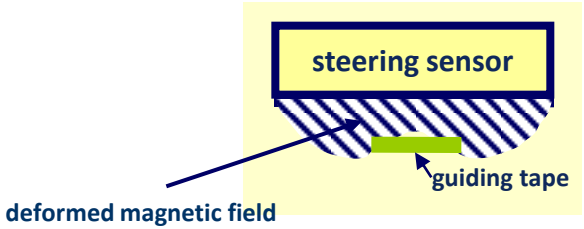
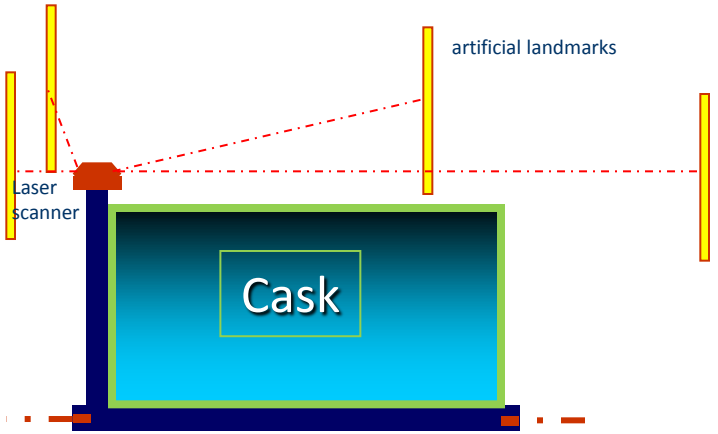
- Navigation and Guidance Strategy for a Flexible (AGV + Free-Roaming) Platform





	Automated Guided Vehicle (AGV)	Laser Guided Vehicle (LGV)	Free-Roaming
	semi-automatic mode		
Path Planning	PHYSICAL PATH	VIRTUAL PATH	
	metal stripe defining the path topology	CAD designed a priori	Computer Optimization online
		download to controller	
Navigation	PRIMARY NAVIGATION	SECONDARY NAVIGATION	
	W-sensor Localization relative to the physical path	Laser scanner Localization relative to a global frame	

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Conceptual study on Flexible Guidance and Docking system for ITER Remote Handling Transport Cask

ERB 5004 CT 96 0127-NET96-431 (EFDA) | [1996-1997]

- Publications from IST team:

  - Pedro Lima, Isabel Ribeiro, Pedro Aparício, “Geometric Feasibility of a Flexible Cask Transportation System for ITER” Proceedings of the 20th Symposium on Fusion Technology, SOFE’98, Marseille, France, September 1998 Vol. 2, pp. 1055-1058.
  - Geometric Feasibility of the ITER RH Casks and Extensions for Free Roaming Navigation, M. Isabel Ribeiro, Pedro Lima, Pedro Aparício, ISR Internal Report RT-402-98, Instituto de Sistemas e Robótica, Instituto Superior Técnico, 1998 – PDF