Foreign Function Interfaces, OpenGL and Game Programming in Haskell

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Structure

- Foreign Function Interfaces, their advantages and disadvantages
- Haskell OpenGL
- Game programming in Haskell
- GLider

Foreign Function Interfaces

- Allow access to functions not in Haskell.
- Allow globals that aren't passed around.
- Need to be kept up-to-date with other language libraries.
- Can be subject to change.
- Can make error tracking difficult.

Game Programming in Haskell

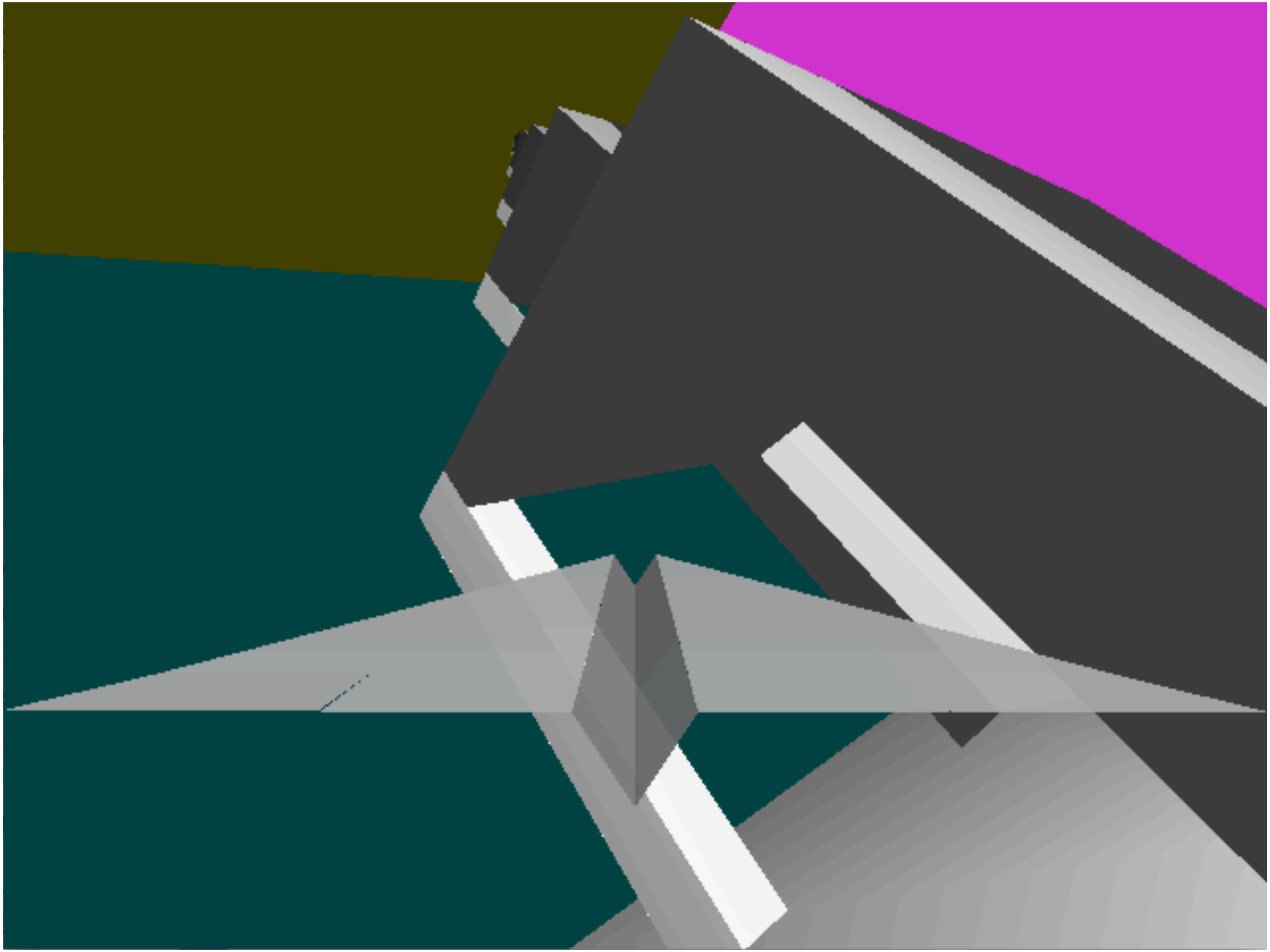
- IORefs used to store game state.
- Purely functional functions and Monadic functions.
- No global state - state must be passed explicitly - encourages use of a smaller data structure or a single “state” type.
- Dynamic and static state.
- Game physics - Realism vs Playability

My Project - GLider

- 3d remake of an old game - fly a paper aeroplane through a house, using air vents for lift, avoiding obstacles.

- Physics - a more unrealistic but more playable model used.


APRIL



GLider - How Haskell Helped

- GLider uses a lot of matrix operations. It is far, far easier to write matrix operations in Haskell than C (even if they don't run as fast).
- Haskell tends to be more terse than C, code easier to maintain.
- Defining level in a haskell file is simple - can easily define objects in terms of other objects.
- Not much data needs to be stored in GLider.

GLider - How Haskell Helped

- Strong typing reduced number of errors.
- Higher order functions such as preservingMatrix replacing pairs of functions reduced errors like an unpopped matrix.
- Vector function arguments meant neater code

GLider - How Haskell Hindered

- Relatively difficult to transfer information from control callbacks to game physics.
- Inconsistencies and gaps in Haskell OpenGL.
- Incentive to keep number of state variables low. Difficult to reassign part of a data structure.
- The function bindings in Haskell are significantly different to C

Conclusion

- Haskell is a mixed blessing for graphics and/or game programming.
- For GLider, a small number of state variables were required. This meant Haskell helped.
- For most games requiring a large number of actors the benefits of Haskell would probably be outweighed by the need to retain a large number of IORefs.