REALIZATION OF 2D ARCADE GAME IN HASKELL USING FUNCTIONAL REACTIVE PROGRAMMING

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Haskelloids

Goal:

To create a clone of a classic game *Asteroids* using **functional reactive programming (FRP)**.

Motivation:

- *Asteroids* is a rather simple two-dimensional graphical game -> not complex in implementation.
- *Asteroids* represents interesting aspects of graphics, physics, artificial intelligence, general game logic.

Technologies used:

- **Haskell.** A standardized, general-purpose purely functional programming language which is statically typed, has lazy evaluation and non-strict semantics.

- *Yampa framework*. Yampa is *a* self-optimizing, arrow-based Haskell combinator library that handles values over time through *signals* which are defined to be a function from time to value.

- **OpenGL.** The *Open Graphics Library* is a library for graphics that was originally published in *C* in and is a state machine, internally representing how it should currently operate in a state.

Lives: 3   Level 1   Score: 0   Time: 5.9423108
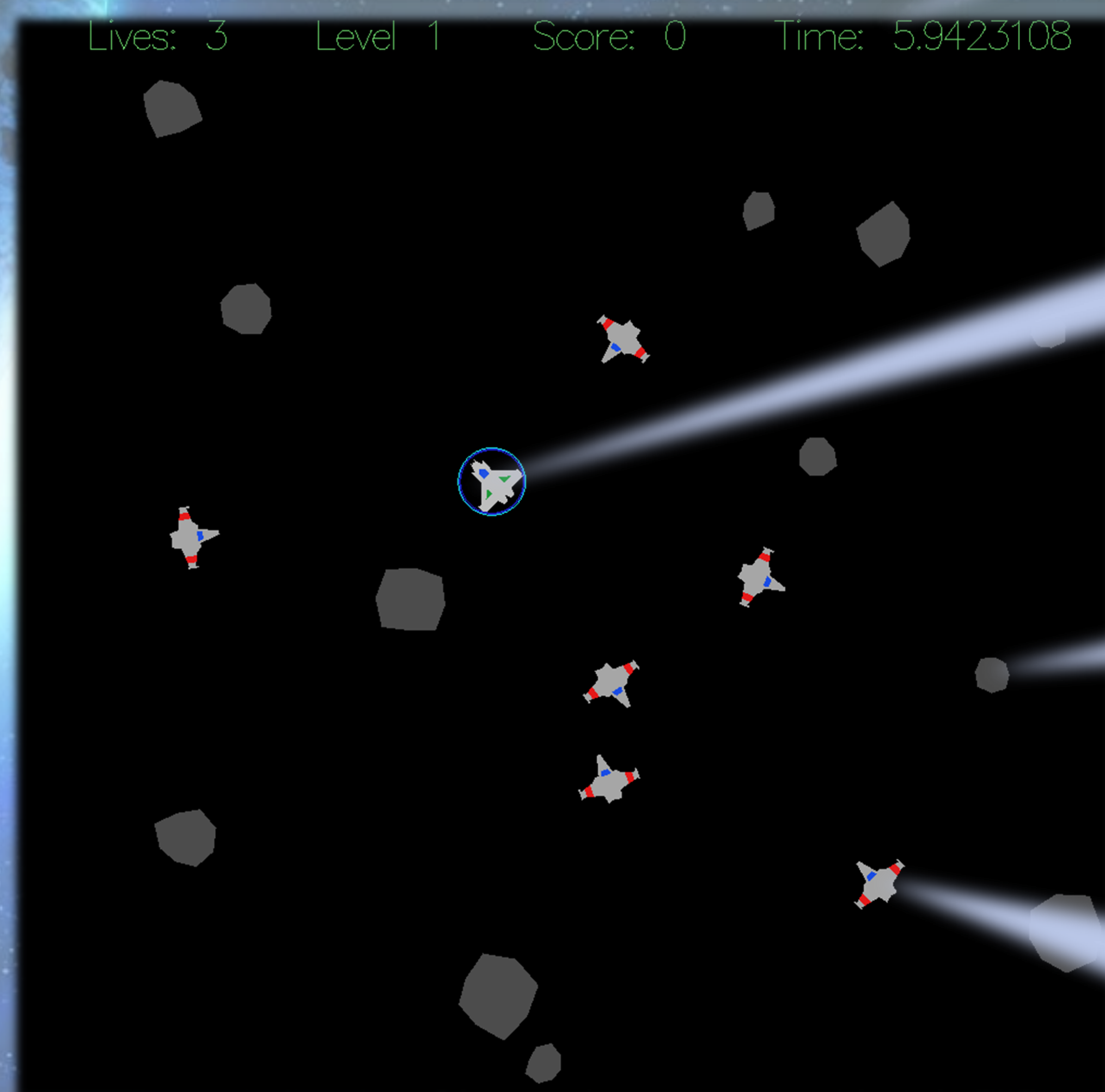
- The game features **asteroids, enemy ships** and a **space ship** which is controlled by a player.
- A simple *User Interface* displaying a current game status on the top of the screen.

- *The player's ship* can thrust towards or backwards using up and down arrow keys.
- The player can **turn the ship** using right and left arrow keys without changing the direction of its movement → the **controls** appear to be **much more complicated** than in the majority of the ordinary games.

- On each level *asteroids* are generated in a random position obtaining a random form, velocity and one of three different sizes.
- Asteroids embody an **obstacle** which is to be avoided or destroyed.

- Enemy ships possess a simple *Artificial Intelligence*.
- In case the speed is too high, they try to **slow down**.
- In case there is an approaching enemy ship or an asteroid, they try to **avoid** it.
- If there is no immediate threat, they **start chasing** the player's ship, making it more difficult for the player to achieve the desired goals.

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