# Leonid Vinnichenko

Senior Software Engineer

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## Sr. Software Engineer

*Align Technology, 2017 - Present*

**Project:**

- Development of a **3D editor** for orthodontists.
- Implementation of functionality for viewing and editing a 3D model of a patient's jaw.
- Creation of features for viewing treatment plans in animation form, analyzing the jaw from different angles, and modifying treatment plans.

**Key Achievements and Responsibilities:**

- Development of UI components using **React**, including:
  - A table for controlling tooth movement with editable cells.
  - Creation and standardization of a set of basic components such as buttons, dropdown lists, and input fields.
  - Implementation of tooltips and context menus: Creation of interactive tooltips and context menus for 3D scene objects based on **React** components.
- Migration of the project from **ES6 to TypeScript**, improving code quality and maintainability.
- Implementation of **Redux** for application state management.
- Using **JSS** for component styling.
- Runtime generation of icons using **canvas 2D** for 3D scene objects.
- Writing unit and integration tests with **Jest** and **puppeteer**.
- Implementing **Drag and Drop** between the 3D scene and React component.
- Backend communication via **WebSocket**: Managing message queue, monitoring connection breaks to ensure continuous interaction between client and server.

**Specific Tasks Related to Three.js and GPU**

- Integration of AMD FidelityFX Super Resolution (FSR) algorithm: Implementation of upscale functionality, achieving 4K rendering at 60 frames per second.
- Implementation of outline effect for 3D objects: Applying Jump Flood (JFA) algorithm based on Distance Field construction to create clear object outlines.
- Migration of the application from WebGL1 to WebGL2: Optimizing rendering processes, allowing color output to multiple textures simultaneously, improving performance and visualization quality.

- Integration of Order Independent Transparency (OIT) algorithm: Solving the issue of transparent objects flickering when rotating the camera, enhancing visual effects quality.
- Porting millimeter grid implementation from canvas 2D to **GLSL shaders** to increase zoom performance.
- Working with 3D mathematics.

## Frontend Developer

*Paragon Software, 2015 - 2017*

**Key Achievements and Responsibilities:**

- Development and maintenance of a personal account as a **single-page application**.
- Utilizing **ES6** and **Angular.js** for creating scalable and maintainable code.
- Ensuring data exchange with the server-side through **RESTful API**.
- Implementing navigation mechanism in the application using **History API**.
- Developing a tool in **Node.js** for converting translations from Excel to JSON, optimizing the localization process.
- Setting up the project build process using **Webpack**.
- Applying **responsive design** techniques for proper display of the application on various devices.

## In my free time

- Rollerblading
- Learning Spanish
- Dancing salsa and bachata
- Exploring Rust and Augmented reality