

On behalf of Shape Labs, Inc., it is my pleasure to provide this letter of recommendation for Nicolas Pfitzer. Nicolas most successfully completed his 6 month internship position as a Computer Vision Engineer Intern at our company from February to August 2024. During his tenure, Nicolas contributed to several key projects, including:

- **Rigging Human 3D Models for Animation:** Nicolas developed a pipeline for rigging human 3D models to prepare them for animation. This involved refining and defusing meshes, computing precise weight and joint matrices for smooth animations, and integrating animations from external sources. The project required meticulous attention to detail to ensure realistic and accurate movement in the final animated models.
- **Posture Analysis:** Nicolas created a comprehensive postural analysis framework using 3D body scans. This project focused on analyzing spine alignment and detecting conditions such as scoliosis, kyphosis, and lordosis. The pipeline also included metrics for assessing hip and leg alignment, with a strong emphasis on the reliability and repeatability of the measurements.
- **Clothing Detection Pipeline:** Nicolas developed a classification pipeline to distinguish between tight and loose-fitting clothing using two parallel neural networks. He significantly reduced inference time through parallelization and sampling techniques. This project was critical in ensuring the accuracy of subsequent posture measurements.
- **Stable Diffusion InPainting:** Nicolas implemented a Stable Diffusion model to fill in missing textures on 3D meshes due to incomplete imaging. This involved generating virtual camera views, creating masks for unseen regions, and using AI to inpaint missing textures. The project improved the quality and completeness of the textured 3D models, which are essential for accurate visual representation.

Nicolas has demonstrated exceptional skills in computer vision, machine learning, and 3D modeling throughout his internship. He fulfilled all his responsibilities and made important contributions to the projects assigned to him during his internship period.

Nicolas consistently impressed us with his ability to immediately grasp and manage the complexity of any task. He tackled challenging problems with many undefined variables and navigated these obstacles with confidence and creativity. Although exceptionally autonomous in his work, Nicolas always knew when to seek clarification or support to ensure the highest level of accuracy and quality. He displayed a strong

ability to adopt new technologies, including those specific to Shape Labs, and delivered production-ready solutions accompanied by comprehensive documentation. His adaptability, technical proficiency, and commitment to excellence were clear throughout his internship.

Nicolas left Shape after completion of his internship and we recommend him most warmly to any future employer.

Alexandre Wayenberg
Shape Labs Inc. - CEO

