

# TurboForge

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Keyshot0: TurboForge (Teaser Image)

## Abstract

We developed an immersive car crafting simulator that allows players to build and assemble the best sports car, Porsche 930 Turbo.

Players will enter a VR garage from the real world after rolling up the door. They can then walk, turn, and teleport freely and smoothly in the garage.

Players will lift the car up and down using a machine and

- Open the door and place the driver's seat
- Grab and install the front/rear bumpers and the exhaust
- Assemble the engine and fix it in the back trunk
- Use a professional machine to balance the wheel and install tires
- Start the engine after all these installations

Players can also toggle a virtual panel to check their progress.



Keyshot1: Engines in the back trunk

## Work Distributions

### Diyang

- XR Interaction Toolkit × Meta Building Blocks basics setup
  - Player, player controllers, camera rigs alignment and matching between the two systems
- Scavenged models' migration to Unity
  - All material and textures fixed, corrections and optimizations
- Select-and-hold system with animations triggered
  - A system based on XRI *simple & poke* interactables to allow triggering of customized animations and audio clips
  - Stages (e.g. open/closed) management for animations
- Layering for interactables to interact only with correct game objects
- Audio system
  - Collections and plugging with APIs and codes
- Additional paperwork and artwork
  - Including poster, teaser images, documentation writing and video trailer editing

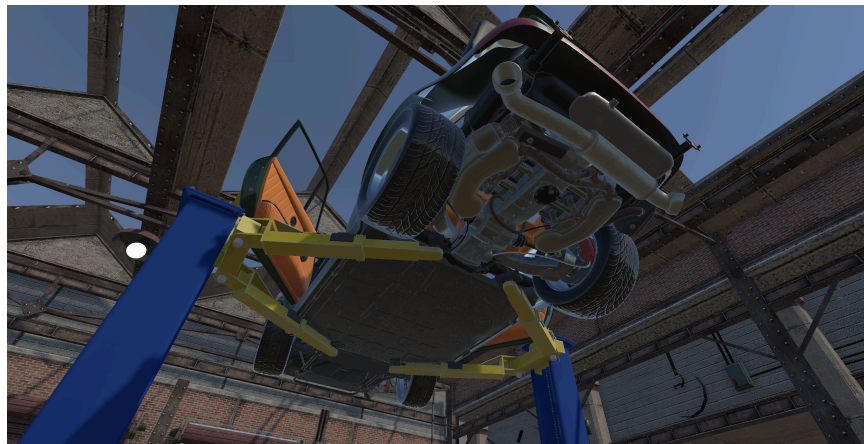
### Hongxiao

- AR/VR portal using stencil buffer
  - Allows back-and-forth travel between AR/VR
- Basic movements (walk, turn, teleport) migrated from the XRI example project
- Environment setup and project management

- Grab-and-snap system with animations
  - A prefab that can be easily configured to allow grabbing and attaching, with a programmable animation
  - Configured all attachable objects including engine parts, exhaust, seat, bumpers, wheels, etc.
- UI implementation
  - Fade in/out
  - Task checked (turned green) after completion
- Smooth scene transition to the final showroom, and ending scene experience with sound effects
- Overall technical and coding assistance for all teammates


### Xinyue

- Overall references collections for models and game mechanics
- Special treatment and animation for wheel assembling part
- Game UI design and implementation of first draft, which is also the game manager function tracks task state and proceed of scenes
- Lighting design and baking for both scenes, fixing material deficiencies
- Models for machines (includes a version of car lift, wheel fitting machine, displaying stage and wheel balancer)
- Technical advices to ensure the game is realistic and fit engineering specifications



Keyshot2: Bottom view of the car

## Scavenged Assets

- [Porsche 930 Turbo Car Model](#)
- [Automotive Garage Workshop Interior 3D Model](#)
- [Car Lift model](#)
- [Porsche engine sound](#)
- [Auto Showroom Studio](#)
-  Big switch sound effect