Delivering 3D & interactive apps on London’s largest project.

Nigel Hunt
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About the speaker

**Nigel Hunt – Director, Producer**

30+ years in the AEC, media and entertainment industry.

Owner/Director, Urbân VFX  
Cofounder and CEO, SiNi Software  
Editor-in-chief, 3Disciple Magazine  
Co-organiser, 3ds London  
Executive Producer, 24 Hours of Chaos  
Industry mentor & guest lecturer.
BACKGROUND AND RELIVANT EXPERIENCE
A brief discussion covering 3 decades of experience that lead to working on large scale master planning and city-scale projects, including lessons learned along the way.

THE PROJECT – WEMBLEY PARK, LONDON, UNITED KINGDOM
Commencing more that 12 years ago, I will outline the project, the project management, production pipeline and software development to keep control and maintain the 3D asset, as it’s expanded over time.

DIGITAL APP PROJECT
I will discuss the proposed client brief, our assessment and technical limitations, our solution and the final deliverables and client response.
Background & Experience
Where it all began, first date with Autodesk in 1988

Christchurch, New Zealand.

First introduced to AutoCAD at college, whilst studying Architectural Design. First impressions, ‘I can draw faster on my drawing board!’

In 1992, I went travelling and unintentionally ended up settling in London, United Kingdom.
The 1990’s

1992  Settled in London. Started working for Sega Europe
1993  Started college to study advanced Autodesk 3D
1994  Contracting as a 3D artist.
1996  Glowfrog Studios formed.
1998  ReplicaNation.com formed.

AutoCAD  Accurender
3D Studio R3 (DOS)  Scanline
3ds Max – present  Mental Ray, Brazil, V-Ray, Corona, Arnold
3ds Max, AutoCAD plugins developer
Growth of the 3D Architectural Visualisation (UK)

The industry has expanded exponentially over 30 years.
1998, taking 3D online with ReplicaNation

- Between 1998-2001, I cofounded ReplicaNation.com, the first online 3D library aimed at the design industry, partnering with 50 of the world’s leading furniture manufacturers.
- It grew to employ 65 people, with offices in the UK, USA, Europe and India.
- At its peak the website and bespoke 3ds Max and AutoCAD software was being used by 25,000 artists, architects and interior designers.

In 2001, the company was voted in the top 100 computer graphics businesses and I was named ‘The Face of 3D’.
Glowfrog partnered with more than repeat 200 clients across many different business sectors, including AEC.

Glowfrog delivered more than 3000 projects of different scale and complexity.

Worked extensively around the world in more than 40 countries.

I have directed, produced and delivered visual effects and graphics on 150+ hours of TV and film.
Selected Clients

It's been a privilege to work with some of the biggest brand names in the world as well as Sovereignty. These include; including Netflix, Universal, HBO, Gensler, Foster and Partners and the Kuwait and Saudi Royal Family.
Feature, TV and Brand Film credits

Production work including, visual effects, animation, motion graphics, film direction, editing, architectural visualization and marketing.
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Credit: Nigel Hunt – Glowfrog - UrbánVFX
6 lessons learned from urban design computer graphics
Knowledge is acquired over time and a process of trial and error, learning and refining with each project.
Greenwich Peninsula, London, UK

Experience gained – project staging and reuse of 3D assets.
Stratford & 2012 Olympics site, London, UK

Experience gained - Multi stakeholder workflow with 40+ architects, engineers and clients.
- We were the ‘eyes’ on the project for the entire delivery team.
Limassol Marina, Cyprus

Experience gained – Optimising 3D scenes for massive datasets and developing a V-Ray proxy and XRef pipeline.
**Metropolis TV series**

*Experience gained* - Use of massive simulation datasets with lots of moving parts.
- To meet project demands, write bespoke tools and scripts.
Metropolis TV series – Tudor London

Bespoke tools allow you to do more work for less.
Shenzhen, China

Experience gained – Simulate reality.
- 30,000 simulated vehicles add to the helicopter shot’s visual narrative.
Kuwait 2035, Kuwait

Experience gained – Concept city design.
Kuwait 2035, Kuwait

Designing a realistic concept city, the size of Singapore.
Dubai Creek Harbour, Dubai, UAE

7.3 million SM of residential space and 3.2 million SM of retail, hotel, office, cultural and community space, creating an urban district capable of accommodating over 200,000 residents, and 450,000 living and working population.

Credit: Nigel Hunt / Glowfrog
Dubai Creek Harbour, Dubai, UAE

Experience gained – authenticity and attention to detail.
- Pay attention to local rules and customs, such as modesty and cultural differences.
Ancient Rome

Bringing everything together.
- Creating our own IP for multi-purposes.

Project Stats

- Timeline: 7+ years
- Models: 800+
- X-Refs: 100+
- Proxies: 1500+
- Software: 3ds Max, V-Ray

Credit: Nigel Hunt / Urbân VFX
Retained Knowledge - Recap

Plan for multi-year staged delivery.

You are the ‘eyes’ on the entire project with many stakeholders.

Design a pipeline that can scale for massive datasets.

Consider writing software and scripts to meet the demands of your workflow.

Design + simulate real-world traffic and people.

Research and push for authenticity and attention to detail.
Project - Wembley Park
Wembley Park, London, UK

Quintain is the developer behind Wembley Park, one of London's most exciting new neighbourhoods and the largest single site of Build to Rent homes in the UK. Quintain acquired its interest in Wembley Park in 2002.
Wembley Park is one of Europe’s largest regeneration projects covering 85 acres. That’s approximately 85 football pitches!

There are more than 90 buildings on site and adjoining neighbourhood. These including residential, commercial, retail, sports and leisure.

Commencing in 2002, Wembley Park is planned to complete by 2027.

The largest built to rent development in the UK plus home ownership, totals 8500 residential homes on site.
Wembley Park, before and after

Wembley Park, pre 2002

Wembley Park, 2020
Project Stats

- **Timeline**: 12+ years
- **Models**: 750+
- **X-Refs**: 200+
- **Proxies**: 4000+
- **Software**: 3ds Max, V-Ray

Credit: Nigel Hunt / Urbân VFX
Visualisation project stages

STAGE A

PLANNING
Beginning in 2008, we were commissioned to work with the planning team on early concept designs and site analysis.

STAGE B

DESIGN
Following the masterplan approval, building plots were put out to tender.

Selected project architects submitted designs in REVIT format that we incorporate into the master viz model for client review.

STAGE C

CONSTRUCTION
The final designs are approved, and the construction phasing can be visualized for site-wide planning considerations, including placement of temporary construction structures, tower cranes, vehicle logistics and pedestrian flow.

STAGE D

MARKETING
The highly detailed 3D model, or digital twin of the site, is used extensively in PR and marketing to the public, stakeholders, commercial and residential tenants.

Films, images, 360 panoramas, schematic illustrations and interactive apps have been generated to promote and sell the project globally.
The evolution of long-term projects, such as Wembley Park, is a series of iterations. The datasets remain in constant change as the design progresses, construction commences, through to the site becoming operational. 3D Assets are continually updated to reflect these modifications and post construction site analysis allows us to match ‘as-built’ details to ensure ‘digital twin’ likeness.
Assess the project software pipeline

At the start of the project we assess the software requirements and off-the-shelf limitations.

We analyze the proposed pipeline, mixing and matching tools to meet specific demands, as well as writing bespoke tools.

- Step 1. Assess the brief based on past experience.
- Step 2. Design a software plan and work methodology.
- Step 3. Write scripts and bespoke plugins.
- Step 4. Reassess and adjust your 3D pipeline at appropriate intervals.
A long-term 3D pipeline that scales

- Disrupting the tried and tested Architect to Visualiser workflow.
- Design tools that speed up the reiteration process and eases the visualization team’s frustration.
- Make it future proof to protect against talent churn and software trends.
BIM/CAD to 3ds Max

Every building on-site gets imported using the same pipeline methodology to ensure the base 3D model integrity remains intact.

The process is repeated for **EVERY** revision issued.

- Step 1. Import models as FBX.
- Step 2. Prepare the imported model for 3ds Max.
- Step 3. Apply V-Ray materials.
- Step 4. Save to the client database and add to the relevant Zone model.
3D model prep process

Step 2. Prepare the model for 3ds Max.
- Scan and fix model issues using SiNi Software’s free Forensic (Available from the Autodesk App Store).
- Use SiNi Software’s extensive plugin collection (Ignite) to create layers and consolidate Objects by Material (Sculpt), remove clutter (Jumble) and fix imported geometry and double faces (Sculpt).

Download FREE Forensic (Activate on SiNi)  Download 30-Day Ignite Trial
Building Plots to Zones

To optimise the workflow, building plots are combined into model zones.

The process is repeated for EVERY revision issued.

• Step 1. Create V-Ray proxies of building plots.
• Step 2. V-Ray proxies and XRefs are linked to zone models from central database.
• Step 3. Zone models are created for high and low poly versions. Project scenes reference these on a project-by-project basis.
Zone Management

Each zone contains all the buildings, infrastructure, props, vegetation and entourage.
- Everything is converted to V-Ray proxies to keep the scene lightweight. To manage the proxies, we use SiNi (Ignite) to quickly change settings scene-wide or as selected.
- This includes round trip conversion from proxies to edit mesh and display settings.
Database and Project Structure

Each client project references the 3D assets maintained in the client database.

This allows each new project to remain focused and only include information specific to that project. I.e. marketing interior images.

- Step 1. XRef the relevant Zone files.
- Step 2. Within the project file, scenes are created, such as interiors and project specific assets are created.
- Step 3. If anything is created that is relevant to the masterplan model, we save to the database and add to project Zone model.
PLAY 360 PANORAMAS
Zone Client Review

Chaos Group's Project Lavina is used for project reviews, both internally and clients.
- No setup needed for 3ds Max/V-Ray pipeline.
- Allows us to hold video conference meetings with immediate real-time feedback without rendering.
Negotiate a long-term retained contract which adds value and benefits all.

Assess your project software pipeline. Is it reliable and stable?

Assess your workflow. Are you factoring in design progression?

Optimize your masterplan into manageable file sizes and zones.

Build a central client database accessible to each new project.

Create or use tools designed for your type of work, i.e. visualizing large master plans.
Wembley Park – Digital App
A sales tool that reinforces brand/buyer confidence
App – Client Brief

- Work as a narrative letting agent tool to present to prospective tenants the whole Wembley Park story.
- Help agents present the overall features of each building and narrow the selection before going to visit apartments with customers.
- Promote the live activities and streamed social media currently taking place on site.
Interactive partnership – Lucid Environments

Lucid is a UK PropTech Consultancy and Creative Agency and Unity interactive specialist.
Project assessment & limitations

We needed a solution for the following questions and concerns.

• Can we make use of the 3ds Max model?
• How do we create a new visual 3D feel in line with the existing client branding?
• We need to develop a platform that brings together a wide variety of media.
• It must be delivered and usable on a variety of devices including; PC, tablets, touch screen and media wall.
• It should allow for video conferencing.
• It must be user friendly with an easy to follow UX.
• How do we communicate the community orientated experience of Wembley Park?
• It needs to be easily and cost effectively updatable.
Project assessment & limitations

The Elephant in the room!

The masterplan 3ds Max model statistics

- 7,000,000,000+ (7 billion+) Polys.
- 4,000+ V-Ray proxies
- 14,000+ Texture maps
- 25 XRefs

- The 3ds Max model remained ‘LIVE’ meaning it was continually being updated during the 7 months project.
- Client budget considerations.
Project assessment & limitations

We assessed if the 3D model could be exported to a game engine.

- Both Unity and Unreal Engine would require months of work to optimise and transfer the 3D assets and rebuild the scene.
- Both would require retexturing.

Further considerations included the UX client requirements, demanding complex media and database integration.
Proposed Solution – Spatial Index

- A way of holding all the different information within a 3D navigable Unity environment.
- Unity was the only off-the-shelf technology that allowed for integration of all client requirements.
Proposed Solution – 3D Navigation and Interactivity

- Three solutions to meet the client brief.
3D Dynamic Turntable – High Detail

- Projection mapping technique using static renders from the 3ds Max aligned to Unity 3D model.
- Bespoke memory saving and live camera masking techniques within Unity to create an interactive turntable of the model where information and highlighting could be projected in real time.
3D Dynamic Turntable – Simplified

- Simplified proxy 3ds Max model imported into Unity.
- Information and highlighting could be projected in real time.
- Trigger animation added to model to respond to user actions.
3D Carousel Navigation

- Simplified 3ds Max model of property imported into Unity.
- Information, highlighting, photos, CGI’s, plans etc appear dynamically surrounding the model.
- Trigger animation added to model to respond to user actions, such as dog walking, rooftop yoga etc.
App Overview - Phase 1
Conclusion
Plan for multi-year staged delivery.

You are the ‘eyes’ on the entire project with many stakeholders.

Design a pipeline that can scale for massive datasets.

Consider writing software and scripts to meet the demands of your workflow.

Design + simulate real-world traffic and people.

Research and push for authenticity and attention to detail.
Negotiate a long-term retained contract which adds value and benefits all.

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Build a central client database accessible to each new project.

Create or use tools designed for your type of work, i.e. visualizing large master plans.
Interactive UX - Recap

Partner with experts and stick to what you excel in, to deliver the best experience.

Always question the client brief and drill down to reveal what’s important.

The success of your App is dependent on end users. Make it simple to use.

Balance aesthetics with information. It’s a sales tool that must add value and sell.

Working in parallel with expert teams allows for up-to-the-wire client changes.

Design your app for easy and cost-effective updating.
Team Credits

Urbân VFX
Nigel Hunt – Director/Producer
Fernando Da Silva – Senior Lead Visualiser
Aaron Casey – Senior Visualiser
Visualisers – Joao Martin, Paulo Santos, Stephen Helsby

Lucid Environments
Robert Small - Creative Director
Neil Small - Managing Director
Amos Willbond - Technical Director
Liam Dickinson - Programmer
Nick Proctor - Designer
Thank you!

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