

video games. On June 3, 2014, Terminal Reality granted Infernal Technology an exclusive license to a number of patents, including the Asserted Patents as defined below, and the exclusive right to enforce same. Infernal Technology and Terminal Reality are collectively referred to herein as “Plaintiffs.”

3. Defendant Sony Interactive Entertainment LLC (“SIE”) is a limited liability company organized under the laws of the State of California, with a principal place of business at 2207 Bridgepointe Pkwy., San Mateo, CA 94404. Sony Interactive Entertainment LLC may be served through its registered agent for service, Corporation Service Company, d/b/a CSC – Lawyers Incorporating Service, 2710 Gateway Oaks Dr., Ste. 150N, Sacramento, CA 95833.

4. Defendant Sony Interactive Entertainment America, LLC (“SIEA”) is a limited liability company organized under the laws of the State of Delaware, with a principal place of business at 2207 Bridgepointe Pkwy., San Mateo, CA 94404. Sony Interactive Entertainment America LLC may be served through its registered agent for service, Corporation Service Company, d/b/a CSC – Lawyers Incorporating Service, 2710 Gateway Oaks Dr., Ste. 150N, Sacramento, CA 95833.

5. SIE was founded in Tokyo, Japan, and established on November 16, 1993, as Sony Computer Entertainment, Inc. (“SCEI”), to handle Sony’s venture into video game development with its PlayStation brand. Since the successful launch of the original PlayStation console in 1994, the company has since been developing the PlayStation lineup of home video game consoles and accessories. The company soon became Sony’s main resource for research and development in the field of video games and interactive entertainment. In 1994, Sony Computer Entertainment America (“SCEA”) (currently SIEA), began to produce the original PlayStation console in North America. SCEI’s North American operations were conducted by Sony Computer Entertainment

of America (SCEA), which was established in May 1995 as a division of Sony Electronic Publishing. As part of a worldwide restructuring at the beginning of 1997, SCEA and Sony Computer Entertainment Europe (SCEA's counterpart in Europe) were both re-established as wholly owned subsidiaries of SCEI.

6. On September 14, 2005, SCEI formed Sony Computer Entertainment Worldwide Studios ("SCE-WWS") to oversee all wholly-owned development studios within SCEI. SCE-WWS became responsible for the creative and strategic direction of development and production of all computer entertainment software by all SCEI-owned studios—all software is produced exclusively for the PS family of consoles. SCE-WWS has been renamed Sony Interactive Entertainment Worldwide Studios ("SIE-WWS"). SIE oversees SIE-WWS's activities regarding developing exclusive video games for PlayStation video game consoles.

7. Sony Network Entertainment International LLC ("SNEI") was founded in April 2010 to operate network services across the Sony group, to offer consumers entertainment experiences across a variety of network enabled devices. Through PlayStation Network and Sony Entertainment Network, SNEI has offered services including PlayStation Store, PlayStation Plus, and PlayStation Vue.

8. In 2016, Sony announced the formation of SIE, which joined the forces of all business units belonging to SCE and SNEI, including hardware, software, content and network services operations relating to video games and consoles. Through the formation of SIE, the companies combine resources across their hardware, software, content and network businesses.

9. SIE is responsible for the PlayStation brand and family of products. The PlayStation family of products and services includes PlayStation 4, PlayStation VR, PlayStation Store, PlayStation Now and PlayStation Vue. SEI is the Sony entity that integrates PlayStation's

hardware, software, content and network operations across the world. SEI undertakes product research, development, design, marketing, sales, production, distribution and customer service for PlayStation hardware, software, content and network services and acts as a developer and publisher of video game titles.

10. SIEA is responsible for the research, development, distribution, marketing and sale of the PlayStation brand and family of products and services in North America. SIEA works with SIE in the development, production, and sales of PlayStation's hardware, software, content and network operations in the United States.

JURISDICTION AND VENUE

11. This is an action for patent infringement arising under the patent laws of the United States of America, Title 35, United States Code. This Court has original jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

12. SIE and SIEA are each subject to this Court's specific personal jurisdiction because of their continuous business contacts in the State of Texas and in this District, including committing acts of patent infringement within the State of Texas and this District, as alleged below. SIE and SIEA each has purposefully directed its business activities to this State and this District. SIE and SIEA each has directly or through intermediaries (including distributors, retailers, and others) shipped, distributed, offered for sale, sold, and advertised its products infringing the asserted patents, as described below, in the United States, the State of Texas, and this District. In addition, SIE has designated an agent for service of process in the State of Texas. Therefore, this Court has personal jurisdiction over the Defendant under the Texas long-arm statute, TEX. CIV. PRAC. & REM. CODE §17.042.

13. Venue is proper in this district under 28 U.S.C. § 1400(b).

14. SIE and SIEA each have major servers located in Plano and Denton, Texas located within the Eastern District of Texas. They each have owned and operated such servers within the Eastern District of Texas for several years.

15. In particular, SIE is the owner of servers located at a data center operated by Aligned Energy in Plano, Texas. This data center is located at 2800 Summit Ave, Plano, TX 75074. In addition, SIE and SIEA are also the owners of servers located at the data center operated by CyrusOne in Carrollton, Texas. This data center is located at 1649 Frankford Road, Carrollton, Texas 75007. Aligned Energy and CyrusOne each offer data center space to companies such as SIE and SIEA to house their own server equipment. Both of these facilities are located in the Eastern District of Texas. SIE and SIEA each have installed server equipment owned by each of them in the physical space located at these addresses. Upon information and belief, SIE and SIEA each exercises exclusive control over these physical servers and the physical space within which the servers are located and maintained.

16. SIE and SIEA utilize a digital media entertainment service known as the Sony PlayStation Network (“PlayStation Network” or “PSN”) to operate its video game business in the United States and throughout the world. Through the PlayStation Network, SIE and SIEA provides web-based services, such as account management, online gaming, instant messaging and chat services, including several “add-on” services such as an online marketplace (PlayStation Store), a premium subscription service for enhanced gaming and social features (PlayStation Plus), movie streaming, rentals and purchases (PlayStation Video), a cloud-based television programming service (PlayStation Vue), music streaming (PlayStation Music, powered by Spotify) and a cloud gaming service (PlayStation Now).

17. The PlayStation Network is a critical component of the Sony gaming business operated by SIE and SIEA. Use of the PSN is essential for PlayStation users to effectively use the PlayStation console and any of the PSN's "add-on" services because Sony requires the user to create or sign-in on a PlayStation Network account and sign in to the account when they turn on a PlayStation console before the user can proceed to use any of its services.

18. PlayStation Network services are in high demand. Sony reports that from 2017 to 2018 the PlayStation Network grew by 80 million users. PlayStation Plus users grew to 34.2 million, and PSN users spend 800 million hours on the network each week. In 2017, SIE and SIEA sold 246 million games requiring a PSN account to play on the PlayStation console.

19. Providing local servers in this District is critical to SIE's and SIEA's optimization of network resources. Connection speed and connection reliability are important factors in providing competitive web-based service users. Therefore, it is necessary for SIE and SIEA to maintain local servers near large population centers to assure proper quality service in those areas. Local servers provide close proximity to a substantial number of users resulting in faster connection speeds for the users. Local servers also reduce the number of transmission hubs between a server and the user. This decreases the chance of data being lost or corrupted during transmission, resulting in a more reliable and stable service. To achieve these benefits, Sony owns and operates servers in this District to serve the vast Dallas-Fort Worth metroplex population.

20. These servers are best characterized as local data warehouses, storing information in local districts to provide the users of SIE's and SIEA's PlayStation Network services with quick access to those services and thereby avoiding the delays associated with data retrieval from more distant data centers. These servers form a part of the PlayStation Network that is critical to the delivery of SEI's and SEIA's video games and other content and actively service a distinct business

need of SIE and SIEA. These servers are owned, operated and controlled by SIE and SIEA and, therefore, are places of business for SIE and SIEA.

21. Thus, SIE and SIEA each have a “place of business” that is “regular” and “established” in the Eastern District of Texas.

THE PATENTS-IN-SUIT

22. On March 26, 2002 the United States Patent and Trademark Office issued United States Patent No. 6,362,822 (the “’822 Patent”) entitled “Lighting and Shadowing Methods and Arrangements for use in Computer Graphic Simulations,” a true copy of which is attached as Exhibit A.

23. On June 13, 2006, the United States Patent and Trademark Office issued United States Patent No. 7,061,488 (the “’488 Patent”) entitled “Lighting and Shadowing Methods and Arrangements for use in Computer Graphic Simulations,” a true copy of which is attached as Exhibit B. The ’488 Patent is a continuation-in-part of the ’822 Patent. The ’822 and ’488 Patents are collectively referred to as the “Asserted Patents.”

24. Infernal Technology is the exclusive licensee of the ’822 and ’488 Patents, and has the exclusive right to sue for and recover all past, present and future damages for infringement of the Asserted Patents.

THE ESTABLISHED VALIDITY OF THE PATENTS-IN-SUIT

25. On April 21, 2016, Electronic Arts Inc. (“EA”) petitioned the U.S. Patent Trial and Appeal Board (“PTAB”) for *inter partes* review of the ’822 and ’488 Patents (IPR2016-00928, IPR2016-00929, IPR2016-00930Z). In the IPR petitions, EA relied upon the following prior art references: (1) Segal, *et al.*, “Fast Shadows and Lighting Effects Using Texture Mapping,” *Computer Graphics Proceedings*, Volume 26, Number 2, July, 1992 (“Segal”); and (2)

McReynolds, “Programming with OpenGL: Advanced Rendering,” SIGGRAPH ’96 Course, August, 1996 (“McReynolds”). With respect to the ’822 Patent, EA asserted that Claims 1-10 and 39-48 were unpatentable under 35 U.S.C. § 103 in view of Segal, and that Claims 1-20 and 39-48 were unpatentable under 35 U.S.C. § 103 as obvious over the combination of Segal and McReynolds. With respect to the ’488 Patent, EA argued that Claims 1-10, and 27-62 were unpatentable under Section 103 in view of Segal and that Claims 1-20 and 27-36 were unpatentable under Section 103 in view of Segal in combination with McReynolds.

26. On October 25, 2016, the PTAB instituted IPR proceedings as to all challenged claims of the ’822 and ’488 Patents. In addition to the Segal and McReynolds references asserted by EA in its petitions, the PTAB instituted IPR based on an additional prior art reference: James D. Foley, *et al.*, COMPUTER GRAPHICS, PRINCIPLES AND PRACTICE, 2^d ed. (1997) (“Foley”). Oral argument was heard by the PTAB on July 18, 2017. On October 19, 2017, and on October 23, 2017, the PTAB issued its Final Written Decisions in the IPR proceedings rejecting all of EA’s challenges to the patentability of all claims of the ’822 and ’488 Patents in view of Segal, alone or in combination with McReynolds and/or Foley. Shortly thereafter, EA settled Plaintiffs’ patent infringement claims and entered into a formal settlement and license agreement with Plaintiffs.

THE INFRINGING ACTIVITIES OF SIE AND SIEA

27. SIE and SIEA are engaged in the business of developing, testing, publishing, distributing, and/or selling video games. Many of these video games employ game “engines,” which are tools available for video game designers to code and plan out a game. SIE and SIEA utilize various game engines to run numerous video games published by them which infringe one or more claims of the patents asserted in this complaint. These game engines are capable of performing deferred rendering, deferred shading, deferred lighting, physically based shading,

and/or physically based rendering used in video games developed, published, distributed, and/or sold by SIE and SIEA. The infringing game engines are collectively referred to herein as the “Accused Game Engines.” The infringing video games that use the Accused Game Engines are collectively referred to herein as the “Accused Games.”

28. The Accused Game Engines and the Accused Games that infringe the asserted patents include, but are not limited to, the following:

	GAME	ENGINE	DEVELOPER(S)	PLATFORM(S)
1	Driveclub		Evolution Studios	PS4
2	Everquest Next	Forgelight	Sony Online Entertainment	PS4, Windows
3	Everybody’s Gone to the Rapture	CryEngine 3	The Chinese Room SCE Santa Monica	PS4
4	Gran Turismo Sport		Polyphony Digital	PS4
5	Horizon: Zero Dawn	Decima	Guerrilla Games	PS4
6	inFAMOUS	(in house)	Sucker Punch Productions	PS3
7	inFAMOUS 2	(in house)	Sucker Punch Productions	PS3
8	inFAMOUS First Light	(in house)	Sucker Punch Productions	PS4
9	inFAMOUS Second Son	(in house)	Sucker Punch Productions	PS4
10	Killzone 2	(in house)	Guerrilla Games	PS3
11	Killzone 3	(in house)	Guerrilla Games	PS3
12	Killzone: Shadow Fall	Decima	Guerrilla Games	PS4
13	Knack	(in house)	SCE Japan	PS4
14	Little Big Planet	(in house)	Media Molecule	PS3
15	Little Big Planet 2	(in house)	Media Molecule	PS3
16	MAG: Massive Action Game	MAG Engine	Zipper Entertainment	PS3
17	Motorstorm: Apocalypse	(in house)	Evolution Studios	PS3
18	Planetside 2	Forgelight	Sony Online Entertainment	PS4, Windows
19	Resistance 2	Insomniac Engine 2.0	Insomniac Games	PS3
20	Resistance 3	Insomniac Engine 3.0	Insomniac Games	PS3
21	Resistance: Burning Skies	Insomniac Engine 2.0	Nihilistic Studios	PS Vita
22	The Last of Us	Naughty Dog engine	Naughty Dog	PS3
23	Uncharted 2: Among Thieves	Naughty Dog 2.0	Naughty Dog	PS3
24	Uncharted 3: Drake’s Deception	Naughty Dog 3.1	Naughty Dog	PS3

	GAME	ENGINE	DEVELOPER(S)	PLATFORM(S)
25	Uncharted 4: A Thief's End	Naughty Dog (?)	Naughty Dog	PS4
26	Uncharted: Drake's Fortune	Naughty Dog 1.0	Naughty Dog	PS3
27	Uncharted: The Nathan Drake Collection		Naughty Dog	PS4
28	Until Dawn	Decima	Supermassive Games	PS4
29	Until Dawn: Rush of Blood	Decima	Supermassive Games	PS4

29. SIE and SIEA are also engaged in the business of manufacturing and selling gaming and entertainment consoles which are designed, among other things, to play video games, including the Accused Games. Among the gaming and entertainment consoles manufactured and sold by SIE and SIEA are the PlayStation 3 and PlayStation 4 products. These PlayStation products are collectively referred to herein as the "Accused PlayStation Consoles." SIE and SIEA has sold the Accused PlayStation Consoles in the United States, including within this District.

30. The Accused Game Engines and Accused Games and Accused PlayStation Consoles are collectively referred to herein as the "Accused Instrumentalities."

CLAIM 1 -- INFRINGEMENT OF U.S. PATENT NO. 6,362,822

31. Plaintiffs incorporate paragraphs 1 through 18 as though fully set forth herein.

32. SIE AND SIEA have directly infringed one or more of the method claims of the '822 Patent by using one or more of the patented methods. In particular, SIE AND SIEA use the lighting and shadowing methods described and claimed in the '822 Patent by providing the Accused Games and the Accused PlayStation Consoles on which they operate which initiate and perform those methods without any user intervention, all in violation of 35 U.S.C. § 271(a).

33. SIE AND SIEA have also directly infringed one or more claims of the '822 Patent by using the deferred rendering method covered by the method claims during development, testing

and demonstration of the Accused Games and causing the Accused Games to be displayed on devices during use, all in violation of 35 U.S.C. § 271(a).

34. Each of the Accused Games performs a rendering method, such as deferred rendering, which meets the limitations of the asserted claims of the '822 Patent.¹ Deferred rendering (also referred to as deferred shading)² is a process for rendering a simulated, three-dimensional (3D) scene whereby the application of light to the scene is “deferred” until after the surface properties for the objects in the scene have been rendered.

35. For example, SIE’s and SIEA’s direct infringement of specific claims of the '822 Patent for certain Accused Games is shown in the claim charts attached hereto as Exhibits C and D.

36. Each of the Accused Games performs a lighting and shadow rendering method for use in a computer system.

37. Each of the Accused Games provides observer data of a simulated multi-dimensional scene.

38. Each of the Accused Games provides lighting data associated with a plurality of simulated light sources arranged to illuminate the simulated multi-dimensional scene, the lighting data including light image data.

39. For each of the plurality of light sources, each of the Accused Games compares at least a portion of the observer data with at least a portion of the lighting data to determine if a

¹ See e.g. <https://www.eurogamer.net/articles/digitalfoundry-2014-vs-driveclub>; <https://www.guerrilla-games.com/read/killzone-shadow-fall-creating-art-tools-for-a-new-generation-of-games>; <https://gamingbolt.com/naughty-dog-reveals-the-tech-behind-uncharted-4-taas-ps4-gpu-usage-deferred-lighting-and-more>.

² See, e.g., <https://learnopengl.com/Advanced-Lighting/Deferred-Shading>.

modeled point within the scene is illuminated by the light source, and stores at least a portion of the light image data associated with the modeled point and the light source in a light accumulation buffer.

40. Each of the Accused Games combines at least a portion of the light accumulation buffer with the observer data.

41. Each of the Accused Games displays the resulting image data to a computer screen.

42. Plaintiffs have been damaged by SIE's and SIEA' infringing activities.

43. SIE and SIEA have had actual notice of the existence of the '822 Patent at least as of the filing of this action.

CLAIM 2 – INFRINGEMENT OF U.S. PATENT NO. 7,061,488

44. Plaintiffs incorporate paragraphs 1 through 44 as though fully set forth herein.

45. SIE and SIEA are directly infringing one or more claims of the '488 Patent by making, importing, using, offering for sale, and/or selling the patented inventions.

46. SIE AND SIEA have directly infringed one or more of the method claims of the '822 Patent by using one or more of the patented methods. In particular, SIE AND SIEA use the lighting and shadowing methods described and claimed in the '822 Patent by providing the Accused Games and the Accused PlayStation Consoles on which they operate which initiate and perform those methods without any user intervention, all in violation of 35 U.S.C. § 271(a).

47. SIE AND SIEA have also directly infringed one or more claims of the '488 Patent by using the deferred rendering method covered by the method claims during development, testing and demonstration of the Accused Games and causing the Accused Games to be displayed on devices during use, all in violation of 35 U.S.C. § 271(a).

48. More particularly, SIE and SIEA have been directly infringing one or more claims of the '488 Patent by making, importing, using (including use for testing purposes), offering for sale, and/or selling the Accused Games, all in violation of 35 U.S.C. § 271(a). The Accused Games perform the lighting and shadowing methods described and claimed in the '488 Patent.

49. For example, SIE and SIEA's direct infringement of specific claims of the '488 Patent for certain of the Accused Games is shown in the claim charts attached hereto as Exhibits E and F.

50. Each of the Accused Games performs a lighting and shadow rendering method for use in a computer system.

51. Each of the Accused Games provides observer data of a simulated multi-dimensional scene.

52. Each of the Accused Games provides lighting data associated with a plurality of simulated light sources arranged to illuminate the simulated multi-dimensional scene, the lighting data including light image data.

53. For each of the plurality of light sources, each of the Accused Games compares at least a portion of the observer data with at least a portion of the lighting data to determine if a modeled point within the scene is illuminated by the light source, and stores at least a portion of the light image data associated with the modeled point and the light source in a light accumulation buffer.

54. Each of the Accused Games combines at least a portion of the light accumulation buffer with the observer data.

55. Each of the Accused Games outputs the resulting image data.

56. In addition, SIE and SIEA have directly infringed one or more claims of the '488 Patent by importing into and selling in the United States the Accused PlayStation Consoles which comprise the elements of one or more of the apparatus claims of the '488 Patent in violation of 35 U.S.C. § 271(a).

57. For example, SIE's and SIEA's direct infringement of Claim 11 of the '488 Patent with respect to the PlayStation 3 Console is shown in the claim chart attached as Exhibit G, and the PlayStation 4 Console is shown in the claim chart of Exhibit H.

58. As set forth in these exhibits, each of the Accused PlayStation Consoles comprises an output to a display screen configured to display image data.

59. As set forth in these exhibits, each of the Accused PlayStation Consoles further comprises a memory for storing data including observer data associated with a simulated multi-dimensional scene, and lighting data associated with a plurality of simulated light sources arranged to illuminate said scene, said lighting data including light image data, said memory further including a light accumulation buffer portion and a frame buffer portion.

60. As set forth in these exhibits, each of the Accused PlayStation Consoles further comprises at least one processor coupled to said memory and said output and operatively configured to, for each of said plurality of light sources, compare at least a portion of said observer data with at least a portion of said lighting data to determine if a modeled point within said scene is illuminated by said light source and storing at least a portion of said light image data associated with said point and said light source in said light accumulation buffer, then combining at least a portion of said light accumulation buffer with said observer data, and storing resulting image data in said frame buffer, and outputting at least a portion of said image data in said frame buffer via said output.

61. Because all of the Accused PlayStation Consoles comprise each of the elements of Claim 11 of the '488 Patent, as exemplified in Exhibits G and H, SIE and SIEA have directly infringed at least Claim 11 of the '488 Patent by importing and selling in the United States the Accused PlayStation Consoles.

62. Plaintiffs have been damaged by SIE and SIEA' infringing activities.

63. SIE and SIEA has had actual notice of the existence of the '488 Patent at least as of the filing of this action.

DEMAND FOR JURY TRIAL

64. Plaintiffs, under Rule 38 of the Federal Rules of Civil Procedure, request a trial by jury of any issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs request the following relief:

1. A judgment in favor of Plaintiffs that SIE and SIEA have directly infringed one or more claims of the Asserted Patents;

2. A judgment and order requiring SIE and SIEA to pay Plaintiffs damages adequate to compensate for infringement under 35 U.S.C. § 284, which damages may include lost profits but in no event shall be less than a reasonable royalty for the use made of the inventions of the Asserted Patents, including pre- and post-judgment interest and costs, including expenses and disbursements; and

Any and all such further necessary relief as the Court may deem just and proper under the circumstances.

Dated: July 11, 2019

Respectfully submitted,

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