**IN THE UNITED STATES DISTRICT COURT**
**FOR THE EASTERN DISTRICT OF TEXAS**
**MARSHALL DIVISION**

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| EYESMATCH LTD.,<br><br>Plaintiff,<br><br>v.<br><br>SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., and SAMSUNG RESEARCH AMERICA, INC.,<br><br>Defendants. | Case No. 2:23-cv-00363-JRG-RSP |

**DEFENDANTS' UNOPPOSED MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS TO ADD THREE RELATED PRIOR ART REFERENCES**

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## I. INTRODUCTION

Defendants Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Research America, Inc. (collectively, "Samsung") respectfully move the Court for leave to supplement their invalidity contentions under P.R. 3-6(b) to add three prior art references—KinectShop[1], Xbox Kinect[2], and Windows Kinect[3] (collectively, the "Kinect systems")—and obviousness combinations based on those references. There is good cause for Samsung's supplementation. Samsung diligently investigated the prior art relating to U.S. Patents Nos. 8,982,109 (the "'109 Patent") and 8,982,110 (the "'110 Patent") (collectively, the "Asserted

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[1] Razorfish's KinectShop Augmented Reality Mirror System, as described in (i) *KinectShop: The Next Generation of Shopping*, Fast Company, 9 June 2011, https://www.fastcompany.com/1758674/kinectshop-next-generation-shopping-exclusive-video (Ex. 4) and (ii) Pachoulakis, I. and Kapetanakis, K. (2012). Augmented Reality Platforms for Virtual Fitting Rooms. *The International Journal of Multimedia & Its Applications*, 4(4), 35-46. 10.5121/ijma.2012.4404 (Ex. 5).

[2] Microsoft's Kinect Motion-Sensing Camera System for Xbox 360, as described in (i) *KinectShop: The Next Generation of Shopping*, Fast Company, 9 June 2011, https://www.fastcompany.com/1758674/kinectshop-next-generation-shopping-exclusive-video; (ii) Pachoulakis, I. and Kapetanakis, K. (2012). Augmented Reality Platforms for Virtual Fitting Rooms. *The International Journal of Multimedia & Its Applications*, 4(4), 35-46. 10.5121/ijma.2012.4404, and (iii) *Microsoft Xbox 360 Kinect Launches November 4*, Gizmodo, 14 June 2010, https://gizmodo.com/microsoft-xbox-360-kinect-launches-november-4-5563148 (Ex. 6).

[3] Microsoft's Kinect Motion-Sensing Camera System for Windows, as described in (i) *KinectShop: The Next Generation of Shopping*, Fast Company, 9 June 2011, https://www.fastcompany.com/1758674/kinectshop-next-generation-shopping-exclusive-video; (ii) Pachoulakis, I. and Kapetanakis, K. (2012). Augmented Reality Platforms for Virtual Fitting Rooms. *The International Journal of Multimedia & Its Applications*, 4(4), 35-46. 10.5121/ijma.2012.4404, and (iii) *Starting February 1, 2012: Use the Power of Kinect for Windows to Change the World, Kinect for Windows Blog*, 9 January 2012, https://web.archive.org/web/20120311200255/http://blogs.msdn.com/b/kinectforwindows/archive/2012/01/09/kinect-for-windows-commercial-program-announced.aspx (Ex. 7).

Patents") and, despite diligent prior art searching, Samsung only recently located the Kinect systems. The Kinect systems are material to Samsung's invalidity case because they anticipate and/or render obvious the Asserted Claims of the '109 and '110 Patents. EyesMatch Ltd. ("EyesMatch") will not be prejudiced from the proposed supplementation as Samsung promptly notified EyesMatch of its intent to supplement the invalidity contentions and provided a draft of Samsung's First Amended Invalidity Contentions and related claim charts on May 17, 2024. Indeed, EyesMatch responded that, while it did not agree there is good cause, it did not oppose this supplement. This case is in the early stages of discovery—the claim construction hearing is scheduled for December 6, 2024 and fact discovery closes on January 13, 2025. Expert discovery will conclude on February 18, 2025. Given the significant remaining time to conduct discovery, no continuance or modification of the Docket Control Order is necessary because the next scheduled deadline is months away. Courts in this District have found good cause to supplement invalidity contentions to add a new prior art reference even later in a case. *See, e.g.*, *Tyco Healthcare Grp. LP v. E-Z-EM, Inc.*, 2010 WL 7853420, at *1 (E.D. Tex. Apr. 1, 2010) (granting leave to add a prior art patent six months before jury selection and finding that "Plaintiffs have sufficient notice of Defendants' invalidity positions"); *Alt v. Medtronic, Inc.*, 2006 WL 278868, at *5-6 (E.D. Tex. Feb. 1, 2006) (finding good cause despite defendant seeking to add eight new references seven months after serving its invalidity contentions and after the conclusion of the Markman hearing). As explained further, there is good cause to permit Samsung to amend its invalidity contentions.

## II. PROCEDURAL AND FACTUAL BACKGROUND

EyesMatch filed its complaint against Samsung on August 8, 2023, asserting infringement of the Asserted Patents, which relate generally to methods of operating a virtual mirror. Dkt. 1.

On December 4, 2023, EyesMatch served its infringement contentions against Samsung, asserting infringement of (i) claims 1-2, 7-9, and 11 of the '109 Patent and (ii) claims 1-6, 10-12, and 16-17 of the '110 Patent (collectively, the "Asserted Claims") by a number of Samsung Galaxy phones, tablets, and laptops at least by way of the AutoFraming functionality.[4] This case is still in the early stages of discovery, as claim construction exchanges do not begin until August 2024. Dkt. 27.

The Kinect systems were not cited during the prosecution of either of the Asserted Patents, in which the Examiner's search was limited to patent publications. Ex. 1. Nor were they cited in previously-filed Inter Parties Reviews[5] by Meta against the Asserted Patents. Samsung conducted a diligent prior art search of the crowded virtual mirror and image processing field before serving its Invalidity Contentions on February 2, 2024. This search, which was conducted independently by Samsung's counsel and third-party search firms, included patent publication searching, a review of relevant academic and trade journal articles, and the file histories of the Asserted Patents and family members. *See* Ex. 2, Declaration of Joshua M. Friedman ("Friedman Decl.") ¶ 2. Despite these efforts, Samsung did not discover the Kinect systems before service of its Invalidity Contentions.

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[4] In its Infringement Contentions dated December 4, 2023 and accompanying claim charts, EyesMatch accuses Samsung's Galaxy Tab S7-S9, Galaxy S21-23, and Galaxy Book2-Book3 product lines of infringing the Asserted Patents via the native Samsung camera application in video mode with AutoFraming.

[5] *Meta Platforms, Inc. f/k/a Facebook, Inc. et al v. EyesMatch Ltd. et al*, IPR2022-00489 (PTAB Jan. 28, 2022); *Meta Platforms, Inc. f/k/a Facebook, Inc. et al v. EyesMatch Ltd. et al*, IPR2022-00490 (PTAB Jan. 28, 2022).

Samsung first became aware of the article *KinectShop: The Next Generation of Shopping*[6] (the "Fast Company article") describing the Kinect systems on or about March 4, 2024. *Id.* at ¶4. Despite Samsung's diligence described above, the Fast Company article was not located until such time primarily because of the searching methods required to find it; which involved in relevant part Google searching and was complicated by the over 12-year-old art field and the need for repeated and creative keyword search terms to distinguish cumulative references within the crowded field. Friedman Decl. at 4. Upon discovering the Fast Company article, Samsung's counsel, Mr. Friedman, conducted further searching for more detailed technical information about the Kinect systems but was unable to locate relevant, non-cumulative technical information at that time. *Id.* Samsung's counsel was diligent in conducting prior art searching throughout the months of March and April 2024. *Id.* at ¶3. On May 6, 2024, Mr. Friedman located a more detailed article, *Augmented Reality Platforms for Virtual Fitting Rooms* by Ioannis Pachoulakis and Kostas Kapetanakis ("Pachoulakis"), which was published in the International Journal of Multimedia & Its Applications in August 2012. *Id.* at ¶5; Ex. 5. At this time, Samsung determined that the Fast Company article in combination with Pachoulakis now provided enough technical detail to warrant consideration for invalidity in this litigation. *Id.* Accordingly, the Kinect systems were not, for all intents and purposes, completely discovered by Samsung, and found to be relevant for invalidity, until May 6, 2024.

After locating Pachoulakis, Samsung diligently analyzed the Fast Company article and Pachoulakis and determined that the Kinect systems anticipate and render obvious the Asserted

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[6] *KinectShop: The Next Generation of Shopping*, Fast Company, 9 June 2011, https://www.fastcompany.com/1758674/kinectshop-next-generation-shopping-exclusive-video.

Claims of the Asserted Patents. *Id.* Samsung then promptly charted the Kinect systems and provided the Kinect systems references, charts, and amended Invalidity Contentions cover pleading to EyesMatch on May 17, 2024—merely 11 days after finding the final and most complete reference for the Kinect systems—and asked EyesMatch whether it would oppose Samsung's Motion for Leave to Amend its Invalidity Contentions. *Id.* at ¶6, Ex. 3. On June 6, 2024, EyesMatch responded that it would not oppose Samsung's Motion. Ex. 3. Samsung then filed the present motion.

## III. GOOD CAUSE EXISTS FOR SAMSUNG'S REQUESTED SUPPLEMENTATION

Courts in this District have broad discretion in allowing scheduling order modifications, including granting leave to amend invalidity contentions. *S&W Enters., L.L.C. v. Southtrust Bank of Ala., NA*, 315 F.3d 533, 535 (5th Cir. 2003). Courts consider four factors to determine whether a party has shown good cause to amend its invalidity contentions: (1) the reason for amendment after the Court's deadline for Invalidity Contentions and whether the party has been diligent; (2) the importance of the amendment; (3) the potential prejudice in allowing the amendment; and (4) the availability of a continuance to cure such prejudice. *See Arbitron, Inc. v. Int'l Demographics Inc.*, 2008 WL 4755761, at *1 (E.D. Tex. Oct. 29, 2008) (*citing S&W Enters.*, 315 F.3d at 535). As explained below, all of these factors weigh in favor of allowing Samsung to supplement its Invalidity Contentions in this case.

### A. The Kinect Systems Were Not Previously Identified Despite Diligent Prior Art Searches

While the Kinect systems were not identified before the due date for Samsung's Invalidity Contentions, it was not for a lack of diligence. Samsung was diligent in analyzing and evaluating

the scope and content of the prior art. As is standard practice, the USPTO searched for prior art relating to the features of each of the Asserted Patents and their family members. And, as part of its search reports, the EPO searched for prior art relating to the family members, European Patent Application Nos. 06711263 and 14200722. Neither the USPTO nor the EPO uncovered the Kinect systems during their prior art searches. Nor did Samsung's two prior art search firms identify the Kinect systems as prior art. Friedman Decl. ¶ 2.

Samsung's outside counsel only found the complete set of references for the Kinect systems after continued, ongoing efforts to locate prior art for several months. *Id.* at ¶¶3-5. Less than two weeks after locating the most complete Kinect systems reference, a detailed analysis of the references and the claims was undertaken, and Samsung prepared claim charts and an Invalidity Contention cover pleading showing how the Kinect systems, alone or with other references, anticipates and renders obvious the Asserted Claims of the Asserted Patents. *Id.* at ¶¶5-6. Once the charts and cover pleading were complete, Samsung promptly provided them to EyesMatch. Ex. 3. Courts have found diligence under similar circumstances. *See, e.g.*, *UltimatePointer, LLC v. Nintendo Co., Ltd.*, No. 6:11-cv-00496-JRG, Dkt. 269 at 6-7 (E.D. Tex. May 28, 2013) (finding that defendants "have been diligent in focusing their invalidity theories" after locating five publicly available prior art references months after serving invalidity contentions); *E-Watch Inc. v. Apple, Inc.*, No. 2:13-cv-1061-JRG, Dkt. 230 at 2-3 (E.D. Tex. Dec. 5, 2014) (granting defendant's motion to add a publicly available international reference that was discovered after invalidity contentions were served as part of the defendant's "investigation in ascertaining the priority dates of one or more of the patents-in-suit"); *Alt*, 2006 WL 278868, at *4 (finding diligence where "Medtronic's discovery of more relevant prior art after narrowing a key issue in this complex and document intensive case is not surprising"). The individual references comprising the Kinect

systems were published over ten years ago in the crowded field of image and display processing, and the fact that multiple patent offices and professional prior art search firms had not identified it previously explains (i) the unawareness of the Kinect systems to Samsung, and that (ii) Samsung was diligent in identifying the references and bringing them to EyesMatch's attention. Thus, the first factor supports supplementation.

**B. The Kinect Systems are Highly Important to Samsung's Case**

This Court has agreed that prior art can be highly important to a defendant's case when it is directed to "the overarching idea of the Asserted Claims." *See UltimatePointer*, No. 6:11-cv-00496-JRG, Dkt. 269 at 7. Given the Kinect systems' clear, novelty-defeating teachings which are applicable to nearly all of the Asserted Patents' claims, the Kinect systems are highly important to Samsung's case and should be considered. More particularly, both the Kinect systems and the Asserted Patents are directed to substantially similar product embodiments: virtual or augmented reality mirror systems which enable shoppers to digitally try on clothes while shopping. The Asserted Patents are directed to "a digital mirror that can record a customer from different angles in the fitting room. The customer can then compare multiple outfits side-by-side or even solicit advice from friends on social media." Dkt. 1 at 3, n.2 (internal citations omitted). This is achieved with, *inter alia*, a camera and a display monitor. *See* '109 Patent cl. 1; '110 Patent cl. 1. Similarly, the Kinect systems are "augmented reality shopping platform[s]" which "allow shoppers to grab items from an unlimited shelf of clothes, see how accessories look at multiple angles, and share the photos with friends on Twitter and Facebook for a quick thumbs-up or down." Ex. 4. The Kinect systems also use a camera and a display monitor to operate. *Id.* Accordingly, the Kinect systems are highly important prior art to Samsung's case because they disclose virtual mirror

systems which are directed to the "the overarching idea of the Asserted Claims" of the Asserted Patents. *See UltimatePointer*, No. 6:11-cv-00496-JRG, Dkt. 269 at 7. The second factor thus favors granting Samsung leave to amend its invalidity contentions. *See id.*

### C. EyesMatch Will Not Be Prejudiced by the Amendment

EyesMatch will not suffer any material prejudice if Samsung's motion is granted. First, and perhaps most importantly, EyesMatch has agreed not to oppose this motion. Ex. 3. Next, discovery is in the early stages, and no case deadline has passed since Samsung's service of its invalidity contentions; the next case deadline (exchange of proposed claim terms) does not occur until August 2, 2024; the claim construction hearing is set for December 6, 2024; and fact discovery does not close until January 13, 2024. Dkt. 27. Samsung provided its Kinect systems claim charts applying to EyesMatch on May 17, 2024. Ex. 3. EyesMatch will have months to evaluate the reference and, insofar as any discovery is needed, conduct discovery regarding Samsung's Kinect systems-based theories before the claim construction process in this case is scheduled to begin. *See Intergraph Corp. v. Intel Corp.*, 2002 WL 34534505, at *1 (E.D. Tex. Jun. 18, 2002) (allowing supplementation of invalidity contentions because they were "served well in advance of the court's claim construction ruling and well in advance of trial."); *Computer Acceleration Corp. v. Microsoft Corp.*, 481 F. Supp. 2d 620, 624-26 (E.D. Tex. 2007) (finding "this factor weighs heavily in favor of allowing the amendment" when defendant "is seeking only one additional prior art patent and claim construction has not yet occurred"); *see also Tyco Healthcare Grp. LP*, 2010 WL 7853420, at *1 (granting motion to amend despite the plaintiffs having notice of the new prior art only after claim constructing briefing completed); *Alt*, 2006 WL 278868, at *6 (finding good cause despite defendant seeking to add eight new references after the

conclusion of the claim constructing hearing); *E-Watch*, No. 2:13-cv-1061-JRG, Dkt. 230 at 3 n.1 (E.D. Tex. Dec. 5, 2014) (granting defendant's motion to supplement that was filed months before the final claim construction briefing deadline).

On the other hand, Samsung will be prejudiced if it is not allowed to supplement its invalidity contentions and rely on the Kinect systems as they anticipate and/or render obvious many of the Asserted Claims of the Asserted Patents. EyesMatch has accused approximately thirty Samsung products of infringement, and the Kinect systems provide a compelling defense which demonstrates that EyesMatch is not entitled to recover for damages related to its claims. The third factor thus favors granting Samsung leave to amend its Invalidity Contentions.

### D. No Continuance of Any Deadline is Necessary

The Docket Control Order would not be impacted and no dates would need to be rescheduled should the Court grant Samsung's motion, as the next case deadline (exchange of proposed claim terms) does not occur until August 2, 2024. Therefore, the fourth factor also weighs in favor of amendment.

## IV. CONCLUSION

For the foregoing reasons, Samsung respectfully requests that the Court grant its Motion for Leave to Supplement its P.R. 3-3 Invalidity Contentions.

Dated: June 20, 2024

Respectfully submitted,

*/s/ Jose Villarreal*

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## CERTIFICATE OF SERVICE

The undersigned hereby certifies that counsel of record who are deemed to have consented to electronic service are being served today, June 20, 2024, with a copy of this document via electronic mail.

*/s/ Jose Villarreal*
Jose Villarreal

## CERTIFICATE OF CONFERENCE

The undersigned hereby certifies that counsel of record met and conferred via email with counsel for Plaintiff indicating that this motion is unopposed.

*/s/ Jose Villarreal*
Jose Villarreal

**IN THE UNITED STATES DISTRICT COURT**
**FOR THE EASTERN DISTRICT OF TEXAS**
**MARSHALL DIVISION**

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|---|---|
| EYESMATCH LTD.,<br><br>Plaintiff,<br><br>v.<br><br>SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., and SAMSUNG RESEARCH AMERICA, INC.,<br><br>Defendants. | Case No. 2:23-cv-00363-JRG-RSP |

**ORDER GRANTING DEFENDANTS' UNOPPOSED MOTION FOR LEAVE TO SUPPLEMENT INVALIDITY CONTENTIONS TO ADD THREE RELATED PRIOR ART REFERENCES**

This matter comes before the Court on Defendants' Unopposed Motion for Leave to Supplement Invalidity Contentions to Add Three Related Prior Art References. After consideration of said motion, the Court is of the opinion that the motion is with merit and being unopposed, should be GRANTED in full.

IT IS ORDERED that Defendants' may supplemental their invalidity contentions.

# EXHIBIT 1

*EyesMatch Ltd. v. Samsung Elecs. Co. et al.*
2:23-cv-00363-JRG-RSP

**EAST Search History**

**EAST Search History (Prior Art)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| S1 | 69798 | mirror same display | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:36 |
| S2 | 1836 | interactive imag$4 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:36 |
| S3 | 38326 | mirror mode or display mode | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:36 |
| S4 | 76 | S1 and S2 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:40 |
| S5 | 6 | S1 and S2 and S3 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:40 |
| S6 | 685 | mirror mode | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:56 |
| S7 | 37719 | display mode | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:57 |

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|---|---|---|---|---|---|---|
| S8 | 1 | S1 and S2 and S6 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:57 |
| S9 | 6 | S1 and S2 and S7 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 16:57 |
| S10 | 29258 | apparel | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:15 |
| S11 | 1 | S2 and S6 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:15 |
| S12 | 914866 | mirror | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:19 |
| S13 | 8 | S2 and S7 and S12 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:19 |
| S14 | 2 | S2 and S7 and S10 and S12 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:19 |
| S15 | 4258150 | imag$4 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:22 |

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|---|---|---|---|---|---|---|
| S16 | 3407 | S15 and S7 and S12 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:23 |
| S17 | 52 | S15 and S7 and S6 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:23 |
| S18 | 1 | S15 and S7 and S6 and S10 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/14 17:23 |
| S19 | 37748 | display mode | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 08:28 |
| S20 | 29270 | apparel | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 08:28 |
| S21 | 915226 | mirror | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 08:28 |
| S22 | 4259521 | imag$4 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 08:28 |
| S23 | 24 | S22 and S19 and S21 and S20 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 08:28 |

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|---|---|---|---|---|---|---|
| S24 | 1534464 | camera or video camera or captur$4 or CCTV | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:03 |
| S25 | 204258 | mirror and display | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:11 |
| S26 | 10046 | (camera or video camera or captur$4 or CCTV) same (apparel or cloth$2 or coat $1 or garment $1) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:26 |
| S27 | 723 | S25 and S26 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:26 |
| S28 | 4259521 | imag$4 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:26 |
| S29 | 607 | S25 and S26 and S28 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:27 |
| S30 | 69841 | mirror same display | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:27 |
| S31 | 191 | S30 and S26 and S28 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:27 |

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| S32 | 5964 | (camera or video camera or captur$4 or CCTV) same (apparel or cloth$2 or garment$1) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:28 |
| S33 | 133 | S30 and S32 and S28 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | ADJ | ON | 2010/07/15 10:28 |

**7/15/2010 11:39:10 AM**
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PLUS Search Results for S/N 11817411, Searched Fri Oct 02 08:21:32 EDT 2009

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

20080151092 80
7394538 67
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4349124 50

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 13843001 | VILCOVSKY ET AL. |
| | **Examiner** | **Art Unit** |
| | VIJAY SHANKAR | 2697 |

| CPC- SEARCHED | | |
|---|---|---|
| **Symbol** | **Date** | **Examiner** |
| G06F 3/005, 3/01, 3/011 | 11/24/2014 | VS |

| CPC COMBINATION SETS - SEARCHED | | |
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| **Symbol** | **Date** | **Examiner** |
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| US CLASSIFICATION SEARCHED | | | |
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| **Class** | **Subclass** | **Date** | **Examiner** |
| 345 | 204-215 | 11/24/2014 | VS |
| 348 | 333.01 | 11/24/2014 | VS |
| 434 | 395 | 11/24/2014 | VS |

| SEARCH NOTES | | |
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| **Search Notes** | **Date** | **Examiner** |
| INVENTORS NAME SEARCH | 11/24/2014 | VS |

| INTERFERENCE SEARCH | | | |
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| SAME | AS SEARCH | 11/24/2014 | VS |

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 14253831 | SABAN ET AL. |
| | **Examiner** | **Art Unit** |
| | VIJAY SHANKAR | 2697 |

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| **Symbol** | **Date** | **Examiner** |
| G06F 3/01, 3/011, 3/005 | 11/25/2014 | VS |

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| 348 | 333.01 | 11/25/2014 | VS |
| 434 | 395 | 11/25/2014 | VS |

| SEARCH NOTES | | |
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| **Search Notes** | **Date** | **Examiner** |
| INVENTORS NAME SEARCH | 11/25/2014 | VS |

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| **US Class/ CPC Symbol** | **US Subclass / CPC Group** | **Date** | **Examiner** |
| SAME | AS SEARCH | 11/25/2014 | VS |

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# EXHIBIT 2

*EyesMatch Ltd. v. Samsung Elecs. Co. et al.*
2:23-cv-00363-JRG-RSP

**IN THE UNITED STATES DISTRICT COURT**
**FOR THE EASTERN DISTRICT OF TEXAS**
**MARSHALL DIVISION**

| | |
|---|---|
| EYESMATCH LTD.,<br><br>Plaintiff,<br><br>v.<br><br>SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., and SAMSUNG RESEARCH AMERICA, INC.,<br><br>Defendants. | Case No. 2:23-cv-00363-JRG-RSP |

**DECLARATION OF JOSUHA M. FRIEDMAN**

**Joshua M. Friedman**, an attorney duly admitted to practice law before the District Court for the Eastern District of Texas, Marshall Division, affirms under penalty of perjury:

1. I am over 18 years of age, and I am an attorney at the law firm of Baker Botts L.L.P., counsel for Defendants Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Research America, Inc., in the above-captioned matter.

2. Prior to February 2, 2024 (the date of service of Samsung's Preliminary Invalidity Contentions), Samsung's counsel, including myself, was diligent in searching for prior art for use in Samsung's Invalidity Contentions. Collectively, our searching included (1) the use of two professional prior art search firms, (2) searching by ourselves (i.e., outside counsel), (3) a review of the (i) prosecution history and (ii) cited art on the face of the Asserted Patents, (4) a review of the (i) prosecution history and (ii) cited art on the face of the Asserted Patents' family members, including foreign patent applications, and (5) a review of the cited art in each of (i) *Meta Platforms, Inc. f/k/a Facebook, Inc. et al v. EyesMatch Ltd. et al*, IPR2022-00489 (PTAB Jan. 28, 2022) and (ii) *Meta Platforms, Inc. f/k/a Facebook, Inc. et al v. EyesMatch Ltd. et al*, IPR2022-00490 (PTAB

Jan. 28, 2022). The prior art searching conducted by (1) the search firms and (2) ourselves included patent publication searching and a review of relevant academic and trade journal articles.

3. Between February 2, 2024 and May 6, 2024, I was diligent in searching for additional prior art and continued such searching on a regular basis.

4. On or about March 4, 2024, I discovered an article from Fast Company[1] (Ex. 4) describing the Razorfish KinectShop (collectively, with the Xbox Kinect and the Windows Kinect, "the Kinect systems") while conducting continued prior art searching. The three individual Kinect systems are each virtual mirror systems which utilize the Microsoft Kinect camera to capture images of the user for display on a monitor, and for virtually overlaying clothing and accessories on the user's image. At that time, I conducted further searching regarding the Kinect systems, but was unable to locate additional, non-cumulative technical information. I ultimately located the Fast Company article by Google searching, which was complicated by the age of the relevant art field—which is at least 12 years old—and the need for repeatedly creative keyword search strings to weed out cumulative references within the crowded field.

5. After additional searching related to the Kinect systems, on May 6, 2024, I discovered an article by Ioannis Pachoulakis and Kostas Kapetanakis, titled *Augmented Reality Platforms for Virtual Fitting Rooms* ("the Pachoulakis article")[2]. The Pachoulakis article provides more complete and detailed information about the technical functionality of the Kinect systems than the Fast Company article. Based on my review of the Pachoulakis article and the Fast Company

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[1]*KinectShop: The Next Generation of Shopping*, Fast Company, 9 June 2011, https://www.fastcompany.com/1758674/kinectshop-next-generation-shopping-exclusive-video.

[2]Pachoulakis, I. and Kapetanakis, K. (2012). Augmented Reality Platforms for Virtual Fitting Rooms. *The International journal of Multimedia & Its Applications*, 4(4), 35-46. 10.5121/ijma.2012.4404.

article, it was my opinion that these two references in combination provided enough technical detail to warrant consideration as prior art in the above-captioned matter and, ultimately, that that the Kinect systems anticipate and render obvious the Asserted Claims of the Asserted Patents.

6. On May 6, 2024, I began drafting the amended supplemental Invalidity Contentions and claim charts for the Kinect systems, which comprised at least the Fast Company article and the Pachoulakis article. I completed the charts and draft amended supplemental Invalidity Contentions on May 16, 2024.

7. Pursuant to 28 U.S. Code § 1746, I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge and belief.

Date: June 17, 2024
New York, NY

Joshua M. Friedman

# EXHIBIT 3

*EyesMatch Ltd. v. Samsung Elecs. Co. et al.*
2:23-cv-00363-JRG-RSP

**Rey, Danielle**

**From:** William Nelson <william.nelson@tensegritylawgroup.com>
**Sent:** Thursday, June 6, 2024 4:07 PM
**To:** Villarreal, Jose; Natasha Saputo
**Cc:** EyesMatch_Service; EXT Smith, Melissa (T-Mobile); DL BB Samsung Eyesmatch
**Subject:** Re: Eyesmatch v Samsung - preliminary invalidity contentions

**[EXTERNAL EMAIL]**

Jose,

Though we disagree that Samsung has shown the necessarily diligence, EyesMatch does not oppose the requested amendment. We request that you provide us a copy of the proposed pleading for our review, so that we can confirm our non-opposition.

Regards,

**WILLIAM NELSON**

tensegrity LAW GROUP LLP

**TENSEGRITY LAW GROUP LLP**
555 Twin Dolphin Drive, Suite 650
Redwood Shores, CA 94065
650-802-6075 (direct)
650-283-3707 (mobile)

---

**From:** Villarreal, Jose <jose.villarreal@bakerbotts.com>
**Date:** Wednesday, June 5, 2024 at 12:53 PM
**To:** Natasha Saputo <natasha.saputo@tensegritylawgroup.com>
**Cc:** EyesMatch_Service <EyesMatch_Service@tensegritylawgroup.com>, EXT Smith, Melissa (T-Mobile) <melissa@gillamsmithlaw.com>, DL BB Samsung Eyesmatch <DLBBSamsungEyesmatch@BakerBotts.com>
**Subject:** RE: Eyesmatch v Samsung - preliminary invalidity contentions

Counsel,
We have yet to receive a response as to whether EyesMatch will oppose the amendment of the invalidity contentions. Please let us know either way so we can file a motion notifying the court.
Regards
Jose

---

**From:** Villarreal, Jose
**Sent:** Wednesday, May 29, 2024 1:17 PM
**To:** Natasha Saputo <natasha.saputo@tensegritylawgroup.com>
**Cc:** EyesMatch_Service <EyesMatch_Service@tensegritylawgroup.com>; EXT Smith, Melissa (T-Mobile)

<melissa@gillamsmithlaw.com>; DL BB Samsung Eyesmatch <DLBBSamsungEyesmatch@BakerBotts.com>
**Subject:** RE: Eyesmatch v Samsung - preliminary invalidity contentions

Natasha,
Thank you for your email. We do not believe the agreement you propose below is necessary for either party to amend preliminary contentions. The discovery order already provides for EyesMatch to amend its preliminary infringement contentions after source code review. As to the proposed preliminary invalidity contention's amendment, the additional prior art was not found until after the preliminary invalidity contentions were served, discovery is in the early stages and the Markman hearing is six months away.

Please let us know if EyesMatch will oppose the amended contentions provided to you on May 17.

Thank you
Jose

---

**From:** Natasha Saputo <natasha.saputo@tensegritylawgroup.com>
**Sent:** Friday, May 24, 2024 11:37 AM
**To:** Villarreal, Jose <jose.villarreal@bakerbotts.com>
**Cc:** EyesMatch_Service <EyesMatch_Service@tensegritylawgroup.com>; EXT Smith, Melissa (T-Mobile) <melissa@gillamsmithlaw.com>; DL BB Samsung Eyesmatch <DLBBSamsungEyesmatch@BakerBotts.com>
**Subject:** Re: Eyesmatch v Samsung - preliminary invalidity contentions

**[EXTERNAL EMAIL]**

Jose,

We disagree that your representation that this new art "was found after the preliminary invalidity contentions due date" demonstrates the diligence necessary to show good cause for amendment. However, we are willing to agree to Samsung's supplemental contentions provided that Samsung agrees that EyesMatch may supplement its infringement contentions once Samsung produces all of the code EyesMatch has requested and following Samsung's pending 30(b)(6) depositions to confirm that Samsung has actually done so. Please provide dates in June when your designated witnesses will be made available.

Regards,
Natasha

**NATASHA M. SAPUTO**

**TENSEGRITY LAW GROUP LLP**
555 Twin Dolphin Drive, Suite 650
Redwood Shores, CA 94065
650-802-6060 (phone)
703-909-5258 (mobile)
650-802-6001 (fax)

**From:** Villarreal, Jose <jose.villarreal@bakerbotts.com>
**Date:** Thursday, May 23, 2024 at 08:09
**To:** Natasha Saputo <natasha.saputo@tensegritylawgroup.com>
**Cc:** EyesMatch_Service <EyesMatch_Service@tensegritylawgroup.com>, EXT Smith, Melissa (T-Mobile) <melissa@gillamsmithlaw.com>, DL BB Samsung Eyesmatch <DLBBSamsungEyesmatch@BakerBotts.com>
**Subject:** RE: Eyesmatch v Samsung - preliminary invalidity contentions

Counsel,
Its been almost a week since we sent the email below. Please let us know by tomorrow if EyesMatch opposes the motion discussed below.
Thank you
Jose

---

**From:** Villarreal, Jose
**Sent:** Friday, May 17, 2024 4:10 PM
**To:** Natasha Saputo <natasha.saputo@tensegritylawgroup.com>
**Cc:** EyesMatch_Service <EyesMatch_Service@tensegritylawgroup.com>; EXT Smith, Melissa (T-Mobile) <melissa@gillamsmithlaw.com>; DL BB Samsung Eyesmatch <DLBBSamsungEyesmatch@BakerBotts.com>
**Subject:** Eyesmatch v Samsung - preliminary invalidity contentions

Counsel,
We write because Samsung intends to amend its preliminary invalidity contentions to include prior art based on Kinect for Windows, Xbox Kinect and/or Kinect Shop. This prior art was found after the preliminary invalidity contentions due date. Attached is the draft Amended pleading and charts. Please let us know if EyesMatch will oppose this motion.
Thank you
Jose

**Jose C Villarreal**
*Partner*
Baker Botts L.L.P.
jose.villarreal@bakerbotts.com
T +1.512.322.2551
F +1.512.322.8351
401 South 1st Street
Austin, TX 78704-1296

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# EXHIBIT 4

*EyesMatch Ltd. v. Samsung Elecs. Co. et al.*
2:23-cv-00363-JRG-RSP

The Wayback Machine - https://web.archive.org/web/20120829112137/http://www.fastcompany.com:80/1758674/kinectshop-next-generat…



# KinectShop: The Next Generation Of Shopping [Exclusive Video]

By Gregory Ferenstein

|

June 9, 2011

A new augmented reality shopping platform for Xbox Kinect will allow users to try on clothes in true 3-D, share photos with friends, and store wish-listed items on smartphones for shopping on-the-go.

Virtual reality shopping just got a lot more real--and could soon become a lot more mainstream. "KinectShop" (working title), an augmented reality shopping platform for the *Xbox Kinect*, exploits the system's new finger-recognition technology to allow shoppers to grab items from an unlimited shelf of clothes, see how accessories look at multiple angles, and share the photos with friends on *Twitter* and Facebook for a quick thumbs-up or down.

"The customer can visually see what an object looks like on them without even entering a retail store," Steve Dawson, Technology Director for the Emerging Experiences group at Razorfish tells Fast Company. Unlike existing virtual shopping that shoehorns 2-D photos on top of body snapshots, "with Kinect, you can find the physical outlines of a person and map it to your body."

We'll soon see just how real the augmented reality is, but in the video demo below, the woman using KinectShop looks just like someone trying on clothes in front of a department store mirror, spinning and shifting her body in the familiar fashion poses.

Microsoft's Kinect has been the *fastest-selling consumer electronic device in history*, has over 10 million owners, and connects nearly 35 million users through Xbox Live--all of whom are capable of online sharing. "This type of experience is really an untapped market because these devices already live at home," says Dawson.

KinectShop is primed to seamlessly integrate with real-life shopping experiences. "With an experience like KinectShop, a shopper can easily scan a QR code or swipe their *NFC* smartphone to take their experience with them and use wayfinding tools to locate the product in-store," Luke Hamilton, Dawson's Razorfish colleague, writes to Fast Company in an email.

A smartphone's ability to activate apps and alert nearby stores to wish-listed items could automate the time-honored skill of deal-finding, too. Imagine digitally trying on a new purse, getting a round of likes on *Facebook*, and then being alerted to a big sale at a nearby store while running errands--futuristic shopping, indeed.

**New Experiences Required New Tech**

The breakthrough grasping technology powering KinectShop was actually built by the Razorfish team. Previous versions of the gesture-recognition technology weren't sophisticated enough to recognize fingers, because hand tracking is one of computer visioning's "biggest challenges," says Dawson. Unlike a face or torso, which maintain the same basic geometric shape, with a hand, "there's so many forms it can take."

The preliminary version that we demoed was a clean experience for simple gestures but still a little buggy: Rotating an open hand to the side activated the grasping command; the algorithm is meant to recognize an open hand by recognizing the negative space between fingers. The final version aims to allow for richer motions, and, in the near future, Kinect is expect to allow single-finger drawing (as was demoed at *E3*).

So, while we're not quite up to the evolutionary pinnacle of opposable thumb mechanics, we will be able to grab what we like--which is really what shopping is all about.

Follow Greg Ferenstein on *Twitter*. Also, follow Fast Company on *Twitter*.

**Read More:** *Most Creative People 2011: Alex Kipman/ Microsoft*


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# EXHIBIT 5

*EyesMatch Ltd. v. Samsung Elecs. Co. et al.*
2:23-cv-00363-JRG-RSP

The International Journal of Multimedia & Its Applications (IJMA) Vol.4, No.4, August 2012

# AUGMENTED REALITY PLATFORMS FOR VIRTUAL FITTING ROOMS

Ioannis Pachoulakis and Kostas Kapetanakis

Department of Applied Informatics and Multimedia, Technological Educational Institute of Crete, Heraklion-Crete, Greece
ip@epp.teicrete.gr
kapekost@epp.teicrete.gr

***ABSTRACT***

*Multi-sensor body scanners combined with new algorithms and social media technologies have started a revolutionary shift away from the classic desktop paradigm and into the direction of intuitive, "natural interaction" where people interface with the technological world through hand gestures, speech and body language. This article reviews recent examples of Virtual Fitting Rooms (VFRs) and supporting technologies which facilitate the shopping experience by letting customers to try-on apparel and/or mix-and-match accessories without being physically present in the retail shop. These platforms are not only powerful decision tools for the on-line shopper, but also contribute to the fun factor of in-store shopping. Using depth scanning techniques, VFRs can create accurate 3D models of shoppers and meaningfully query retail digital catalogs, filter out non-fitting items and allow customers assess the styling and matching aspects in real time. In addition, omnipresent social networking features allow sending photos or videos of the shopper wearing the apparel for quick feedback. The quality of service provided by current VFRs is sufficiently high to boost sales but also minimize returns due to improper fit.*

***KEYWORDS***

*Augmented Reality, 3D scanning, cloth models, simulations*

## 1. INTRODUCTION

Shopping is a time-consuming activity for some people, while for others a much enjoyed one. Many approaches have been tried in the not so distant past to make it possible to simultaneously answer two fundamental shopper concerns: "does it suit" and "does it fit", therefore reducing much of the guesswork involved in shopping. For example, by using 2D CAD patterns of actual garments that correspond to regular sizes commonly found on a shop floor, [1] present a methodology for producing 3D clothes with realistic behavior, while at the same time providing users with a "feel" for the garment's details. The 3D graphics technologies applied in [2] help create and simulate a virtual store. They also present a Web application which provides powerful access to and manipulation of garments to facilitate garment design, pattern derivation and sizing. The 3D geometrical modeling algorithm in [3] is based on the mapping of 2D objects on a 3D model and is incorporated in a methodology that can be applied to the automatic modeling of various "secondary" garment parts like collars, waist bands and pockets. The approach aims to automate the process of 3D garment modeling from flat patterns and leads to an intuitive interface for novice users.

Furthermore, [4] apply a pattern designers' draping technique which lays down cloth on a dummy and seeks a final pattern shape by iterative cutting. Real garment pattern design methods using chalks, pins and scissors are replaced with a NURBS cutting curve and mesh cutting algorithm. The process allows artificial cloth to be draped on a mannequin and cut and edited interactively.

DOI : 10.5121/ijma.2012.4404

A method of applying geometry images to cloth simulation [5] purports to obtain cloth motion for surface meshes of arbitrary genus, while retaining the simplicity of a mass-spring model. That work also adapts an implicit/explicit integration scheme, utilizing the regular structure of geometry images, to improve performance. Additionally, the cloth is able to drape over other objects, also represented as geometry images. The method is efficient enough to allow real-time simulation of fairly dense cloth meshes. The study of [6] applies 3D technologies to assess garment fit in order to evaluate the usability of pattern customizing technologies. It presents primary data from experiments on the provision and testing of garment fit of specified size patterns for a jacket and skirt as well as findings on virtual and human fit trials and an evaluation of the 3D technology. The study evaluates procedures and presents problematic features of the 3D fitting software concluding that, although some issues concerning efficient provision and testing of fit still exist, 3D technology overall provides adequate evaluation of fit.

The simulation method in [7] is based on six pieces of Bezier curved surfaces and generates a 3D dress model by using 32 pieces Bezier curved surfaces. In addition, the method reaches satisfying simulation results quickly. The key aspects of Virtual Prototyping and enabling technologies in the fashion industry are discussed in [8] along with their benefits and shortcomings. In particular, available technologies in the conceptual and design phases of the fashion products development chain show that prototyping in a virtual environment is feasible for specific goals and applications. Indeed, methodologies that shorten the development and production time justify considerable investments. In order to provide online apparel stores with an easy way to build a 3D clothing show room, [9] proposes 3D garment generation using 2D garment photos instead of 2D CAD patterns. All essentials for duplicating a garment in 3D are extracted from a photo. A magnet-based interior nodes insertion method and Delaunay-based triangulation are used to produce uniform garment meshes. The back and front garment meshes are then automatically seamed around a virtual mannequin based on the mass-spring model. The aim of the research is to develop a convenient and friendly virtual show room for people who do not have access to 2D CAD patterns of real garments.

The design of camera-based technologies to support retail shopping in a physical store is explored in [10]. The method uses an implicitly controlled video technology that allows shoppers to directly compare currently worn garments with images from the previously worn garments, with the twist of orienting images from past trials to the shopper's current pose as he/she moves. The system also allows comparison to clothes that other people in the shoppers' social network are wearing. The clothing animation framework in [11] integrates several key clothing animation techniques. In addition, an interactive system is set up on the three-tier architecture that provides users with basic functionalities including cloth animation, human model editing and clothing simulation. The interactive editor provides a set of intuitive tools for animators to design a rich variety of human shapes and cloth animation. As a prototype system for clothing animation and virtual dressing, it is fast, reliable and expandable.

Driven by the human perception of garment sketches, [12] propose a context-aware garment sketch interpretation based on a set of observations about key factors that affect the shape of garments. Based on this analysis they develop a geometric method for sketch-based modeling of garments which obtains more realistic results than previous techniques. The effectiveness of this method is demonstrated on a variety of inputs while validation of the approach was performed via a user study where viewers were asked to compare the believability of our outputs versus previous ones. The fast 3D garment simulation method introduced in [13] generates 3D clothing models by using several pieces of Bezier curved surfaces based on body data. The work proposes the spatial analytic geometry algorithm by which determines the positions of control points. Furthermore, the cutting piece is simulated by fitting quadratic Bezier curves. Experiments show that the static models performed satisfactory with a rendering performance of 1-3 seconds, which is almost appropriate for online trying.

A system that allows users to interactively control their 3D model at home using a commodity depth camera is presented in [14]. The model can then be augmented with (downloaded) virtual clothes, resulting in private, enjoyable, virtual try-on experience. As a first step, the user needs to create his or her 3D using a multi-camera setup that captures him or her in a fraction of a second, after which a 3D model is created. The model is subsequently transmitted to the user's home system to serve as a realistic avatar for the virtual try-on application. The system provides free-viewpoint high-quality rendering with smooth animations and correct occlusion, and therefore improves the state of the art in terms of quality. It utilizes cheap hardware which makes it appealing to a wide audience.

The interactive garment design tool in [15] enables interactive bidirectional editing between 2D patterns and 3D high-fidelity simulated draped forms, providing for a continuous, interactive, and natural design modality in which 2D and 3D representations are simultaneously visible and seamlessly maintain correspondence. Artists can now interactively edit 2D pattern designs and immediately obtain stable accurate feedback online, thus enabling rapid prototyping and an intuitive understanding of complex drape form. Finally, [16] examines augmented reality solutions for e-commerce to show that it is possible to define a strong platform for marketing products and for advertising promotions. The approach is based on introducing computer vision in a hands-free augmented reality setting. The proposed framework is prepared to operate in two different environments: personal computers and public street marketing places.

Clearly then, Virtual Fitting Rooms (VFRs) have already started to revolutionize the state of affairs in both retail and e-tail industries by letting customers try-on apparel and mix-and-match accessories without being physically present in the retail shop. These applications draw on multiple technologies to finally make it possible address the "suit"/"fit" dilemma. On the hardware side, multi-sensor bars like Microsoft Kinect and ASUS Xtion have brought depth scanning to the masses by allowing accurate full-body depth maps and gesture recognition via supporting frameworks. In addition, VFRs rely heavily on Augmented Reality (AR), which employs specialized software and hardware to merge the digital and the physical worlds by immersing digital information into real video to generate persuasive looking scenes in real time.

Modern VFRs combine AR technologies with depth and color data to provide robust body recognition functionality and successfully address the fit and suit aspects of shopping. In addition, promising platforms offer real-time video simulations which allow customers to visualize products as part of their current outfits and view them from multiple angles. These platforms are not only powerful decision tools for on-line shopping but also increase the fun factor for in-store shopping. The present article reviews successful examples of VFRs and discusses fundamental technologies behind some of these shopping and advertising tools, many of which employ full-body scans to offer only pieces of clothing with a satisfactory fit and at the same time facilitate the styling and matching aspects of shopping.

## 2. NATURAL INTERACTION (NI) SENSORS AND SUPPORTING SOFTWARE PLATFORMS

Natural Interaction (NI) is the ability to command and control the digital world using hands, body and voice, making traditional peripherals such as remote controls, keypads and mice obsolete. Based on technologies where the entire body is the controller, Natural User Interfaces (NUIs) deviate massively from the classic desktop paradigm, as they use body gesture recognition to navigate applications and complete tasks such as browsing, selecting, adding to shopping basket and checking out. At the same time, by accommodating gestures that by nature are highly personalized, NUIs are addressed to the entire population instead of only the technologically savvy.

Some of the basic players in the Virtual Fitting Room industry appear in Fig. 1, where current technological advances from multiple areas converge. Presently, the main NI players in the hardware sensor consumer market are Microsoft with Kinect and Asus with Xtion, both of which utilize the PS1080 chip from Prime-Sense in competing implementations. Real-time modeling of natural scenes with commodity sensors and graphics hardware has catapulted augmented reality (AR) to an entirely new level by allowing real-time reconstruction of dense surfaces with a level of detail and robustness beyond the capabilities of previously available solutions that used passive computer vision. These multi-sensor bar products collect synchronized audio, video and depth data streams to be manipulated to suit a rich gamut of applications using a number of software frameworks.

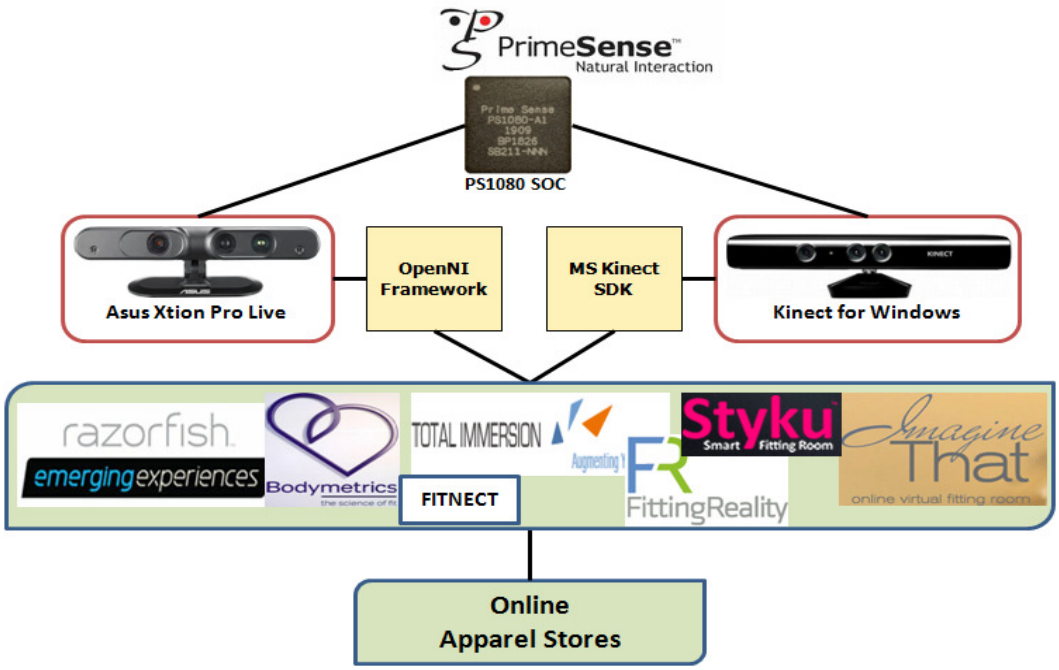



Figure 1. Various players in the Virtual Fitting Room Arena

Microsoft Kinect (an acronym which results from combining the words kinetic and connect) was marketed in November 2010 and is marketed in two versions: Kinect for the Xbox game console and Kinect for Windows, the latter of which sells at a higher price and incorporates enhancements such as "near mode" operation, skeletal tracking control, API improvements, improved USB support across a range of Windows computers and Windows-specific acoustic models [17]. As a voice-activated console that incorporates video capturing and facial recognition capabilities, Kinect can be employed in a wide range of applications. Microsoft has also designed Kinect as an enhancement to the Xbox Live experience. Xbox Live Video Chat makes use of Kinect's cameras and microphones for a webcam-like live chat with multiple friends at once.

The Xtion from Asus exists in three versions: Xtion, Xtion Pro and Xtion Pro Live. The last two of these are bundled with drivers, OPNI NITE middleware compatible SDK and are addressed to developers. The Live version basically adds an SXGA RGB camera for live image/video capture. Both Kinect and Xtion PRO LIVE use infrared sensors, adaptive depth detection technology, color image sensing and audio stream to capture a user's real-time image, movement, and voice, making user tracking more precise. The main characteristics of the Kinect and Xtion sensors appear in Table 1.

Table 1. MS Kinect and Asus Xtion (Pro-Live version) pertinent characteristics.

| **Specification** | **Microsoft Kinect** | **Asus Xtion Pro-Live** |
|---|---|---|
| Field of View | 57° H, 43° V | 58° H, 45° V |
| Sensors | RGB & Depth | RGB & Depth |
| Depth Range | 1.2m – 3.5m | 0.8m – 3.5m |
| Depth Steam | QVGA (320x240) 16-bit @ 30 fps | VGA (640x480) @ 30 fps<br>QVGA (320x240) @ 60 fps |
| RGB Stream | VGA (640x480) 32-bit @ 30 fps | SXGA (1280*1024) @ 30 fps |
| Microphones | 3 (left) + 1 (right) | 2 mikes for stereo capture |
| Power Supply | 12V DC + 5V USB connection | 5V USB connection |
| OS Support | Win7 32/64 | Win 32/64: XP , Win7<br>Linux Ubuntu 10.10: X86,32/64 bit |
| Dimensions / Weight | 12” x 3” x 2.5” at 3.0 lb | 7” x 2” x 1.5” at 0.5 lb |

The supporting software environments for both sensors enable developers to create custom gesture-based applications without the need to write complex programming algorithms:

- Gesture detection: The ability to track hand motions in real-time, thus turning the user’s hands into controllers.
- Full-body detection: The ability to track the users’ full body movement with support for multiple player recognition, making it ideal for full-body gaming.
- RGB image sensing captures real-time video scenes that can be used separately or in combination to the synchronized depth-image data to various application-specific purposes.
- Audio streaming allows support for voice control and other voice recognition applications.

Mainstream development environments for NI sensors such as Kinect and Xtion include the OpenNI Framework, the Microsoft Kinect SDK and the Point Cloud Library. The Open Natural Interaction (OpenNI) [18] organization is an industry-led, non-profit organization formed to certify and promote the compatibility and interoperability of NI devices, applications and middleware. The organization includes partners like PrimeSense (a semiconductor company headquartered in Tel Aviv, Israel, with expertise in natural interaction and 3D depth sensing solutions) [19], Willow Garage (personal robotics applications) [20], Side-Kick (motion control games) [21], Asus (provides hardware such as the Xtion for OpenNI applications) [22] and AppSide (end-to-end content marketplace for motion-controlled entertainment devices) [23]. PrimeSense produces the PS1080 SOC, the heart of NI hardware such as MS Kinect and ASUS Xtion. The chip synchronizes the depth image, color image and audio streams obtained from the device’s cameras and microphones and implements in hardware all depth acquisition algorithms. In addition, it provides a USB 2.0 interface to communicate data to the host.

OpenNI is a multi-language (C, C++, C#, Java), cross-platform open-source, freely downloadable and documented [18] framework that defines APIs for writing applications utilizing Natural Interaction. OpenNI provides an Application Programming Interface (API) to allow communication with both low level devices (e.g. vision and audio sensors), as well as high-level middleware solutions (e.g. tracking using computer vision) and can be used to develop applications utilizing natural interaction. OpenNI APIs are composed of a set of interfaces for

writing NI applications. The main purpose of OpenNI is to form a standard API that enables communication with both (a) vision and audio sensors (i.e., the actual devices that "see" and "hear") and (b) vision and audio perception middleware (i.e., the software components that analyze and handle the streamed audio and visual data from the scene). For example, software that receives visual data, such as an image, returns the location of the palm of a hand detected within the image.

The OpenNI Framework provides the interface for physical devices and for middleware components. Its architecture is built around modules, production nodes and production chains.

- OpenNI modules are hardware- or middleware-specific program units enabled by the OpenNI Framework API that are registered in the OpenNI framework and subsequently used to produce sensory data.

- OpenNI Production Nodes are sets of units that have a productive role in the process of creating the data for NI-based applications. For example, a User Generator is a production node that produces body data and a Depth Generator is a production node that takes raw sensory data from a depth sensor and outputs a depth map.

- OpenNI Production Chains allow the simultaneous registration of several modules to a single OpenNI implementation. The process makes the selection of specific sensor devices and middleware components with which to produce and process data more flexible and at the same time creates more robust and reliant optional node sequences.

Finally, OpenNI Arena [24] is a forum where developers can get information on how to create and upload OpenNI-compliant applications.

The Kinect algorithm discussed in [25] uses a low-cost depth camera and commodity graphics hardware to create accurate real-time depth mappings of complex and arbitrary indoor scenes in variable lighting conditions. The described system works well for mapping volumes up to seven cubic meters. In addition, Kinect utilizes face and voice recognition to identify a given person in a group, a very useful feature for group games. Microsoft Kinect SDK v1.0 [26] provides access to the desired functionality in Windows 7 Visual Studio.NET environments. Version 1.5 of the SDK is expected by end of May 2012 [27] and promises "seated" or 10-joint skeletal tracking, providing the capability to track the head, neck and arms of either a seated or standing user in both default and near mode. A comparison of the MS Kinect and PrimeSense OpenNI SDKs exists at [28].

The Point Cloud Library [29] is a large scale, open–source project for 3D point cloud processing [30]. It is released under the terms of the Berkeley Software Distribution (BSD) license and is free for commercial and research use. The PCL framework contains numerous state-of-the art algorithms including filtering, feature estimation, surface reconstruction, registration, model fitting and segmentation. These algorithms can be used to filter outliers from noisy data, stitch 3D point clouds together, segment relevant parts of a scene, extract keypoints and compute descriptors to recognize objects in the world based on their geometric appearance, as well as create surfaces from point clouds and visualize them. The short videos in [31] briefly compare the capabilities of KinectFusion and PCL.

To simplify development, PCL is organized in a set of modular libraries which can be compiled separately. This modularity is important for distributing PCL on platforms with reduced computational or size constraints. Source code and prebuilt binaries for Linux, Windows and Apple Mac OS X are currently available for download [30]. The code relies heavily on the NVidia CUDA [32] development libraries for GPU optimizations and requires a compatible GPU

for best results. The system is continuously refined and improved by a world–wide group of dedicated developers to model larger scale environments in the near future. Finally, a stable release (version 2.0) is expected in 2012.

## 3. VIRTUAL FITTING ROOM (VFR) APPLICATIONS

VFR-enabled shopping is available for stores, homes and smart mobile devices. Successful VFR applications, successful representatives of which will be discussed presently, automatically generate precise body scan data to guarantee the quality of fit. These "Body Shape" IDs can be manipulated to various purposes. One is to create accurate 3D avatar-type models of the customer's body on which to fit clothes as an alternative to fitting on the shopper's image itself. Another way to go is to combine 3D scan data with information such as gender and age to meaningfully query virtually unlimited clothing databases across multiple retailers, to order for family and friends, etc. Furthermore, granting access to accurate 3D models of garments and apparel from designers enables VFR technologies to incorporate physics to enhance and make more realistic the shopping experience. In addition, the incorporation of the communication and feedback capabilities of social media to obtain advice and feedback (e.g., tweeter, facebook) make the shopping experience even more enjoyable. Finally, smart-phone applications may also alert users for wish-listed items available in nearby stores to so that local shopping and deal finding can be usefully combined.

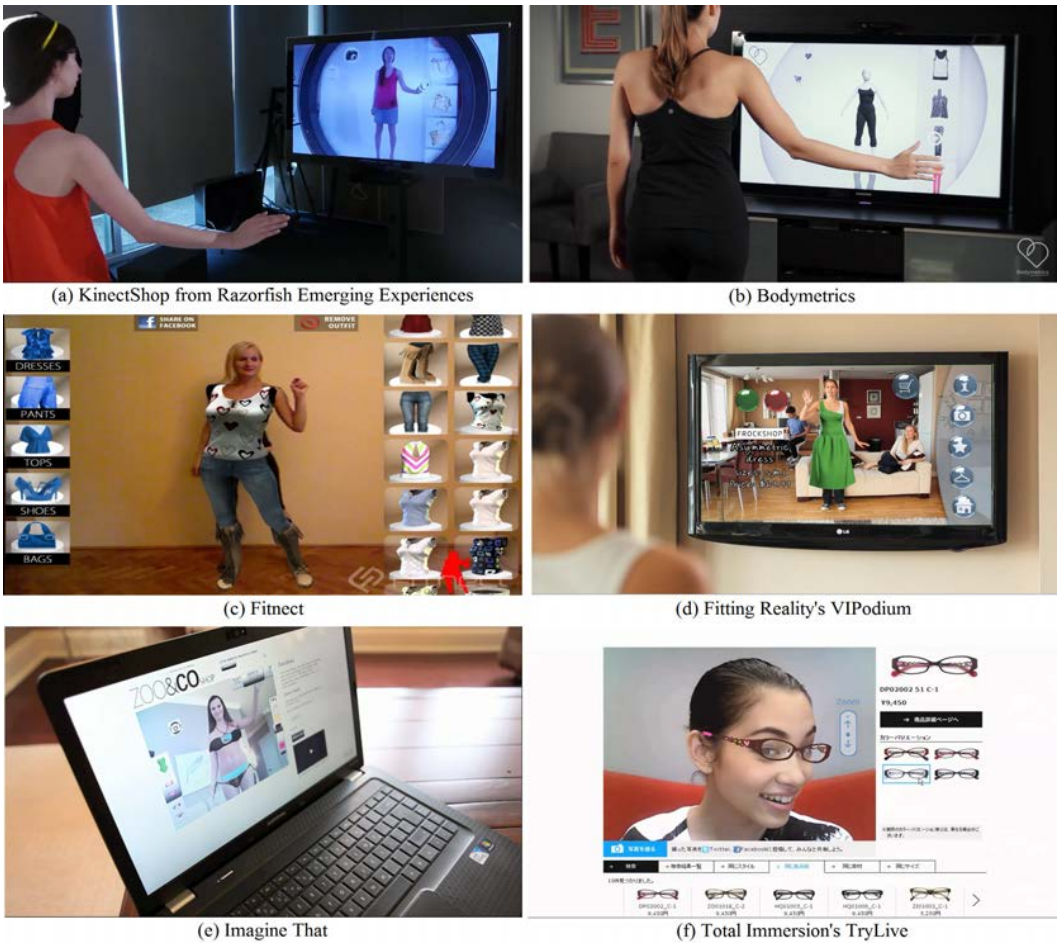
By successfully addressing the suit/fit dilemma, VFRs present unique opportunities for retailers in multiple directions. Shopper assurance of a "perfect fit" removes an important obstacle for on-line shoppers and should result in increased sales and decreased return rates. Multiple marketing channels increase on-line brand visibility. Interest shown on a per-item or per-category basis can also be utilized on a per-individual or at an aggregate (e.g., regional) level. In the following we will review some of the most successful applications in the Virtual Fitting Room industry.

### 3.1. KinectShop from Razorfish Emerging Experiences

KinectShop is an on-line AR shopping platform created by the Emerging Experiences team at Razorfish. Based on the Xbox Kinect sensor, the platform translates customer's real-life motions into on-screen movements to allow browsing through an unlimited virtual shelf of accessories and select apparel to try on in true 3D in front of a big-screen TV that acts as a virtual mirror Fig. 2(a). In addition, customers can use the Kinect RGB camera to create an album of different looks at multiple angles to share with friends via social networks, collect votes (likes and dislikes) and also store their wish-list on their smart-phones for on-the-go shopping. Social networking can also be employed to alert customers for the availability of wish-listed items in nearby stores at discount prices.

### 3.2. Bodymetrics

In a partnership with PrimeSense, Bodymetrics [33], a London-based technology company, has created 3D body scanning solutions for both retail stores [34], [35] and home customers. The retail version of the body scanner uses eight PrimeSense 3D sensors to map the customer's body for quick and accurate calculation of 100 measurements which are subsequently used by "Fit Stylists" to find garments that best suit the customer's unique shape and size. The home buyer solution employs the same PrimeSense-based NI sensors like Microsoft Kinect and ASUS Xtion to allow shoppers to have their body data scanned in and saved to an on-line profile.




(a) KinectShop from Razorfish Emerging Experiences
(b) Bodymetrics
(c) Fitnect
(d) Fitting Reality's VIPodium
(e) Imagine That
(f) Total Immersion's TryLive

Figure 1. Screen shots sampling mainstream functionality for reviewed Virtual Fitting Rooms

Bodymetrics partnered with the Razorfish Emerging Experiences team to incorporate this technology into an on-line shopping platform which uses the saved profile of a customer to (a) create an on-screen customer-sized avatar which follows the customer's motions through the NI sensor and (b) virtually try on various clothing types such as jeans, dresses, skirts and tops from connected partners, as seen in Fig. 2(b). In addition, as each piece of clothing is mapped onto the avatar's body, a color map is overlaid on the garment to depict the tight spots of the garment so that the customer can, for example, move on to another size or to an altogether different garment type. A retail version of the platform is deployed in stores and uses 3D scanning technology in a private booth to obtain an avatar that presumably corresponds even better to the customer than the home version which employs NI sensors like the MS Kinect and Asus Xtion. The "perfect fit" which is guaranteed from such technologies works to the benefit of both the customer (who can buy with increased confidence) and the retailer (who benefits from both increased sales and decreased rates of returns).

### 3.3. Fitnect

Fitnect implements an interactive AR virtual fitting room which uses the Kinect sensor as a 3D full-body capture device. A Natural Interaction user interface employs floating buttons to allow customers to browse the catalog and virtually try on garments of their choice (Fig. 2(c)). In addition, Fitnect uses 3D models of clothes and cloth physics for a more convincing experience. However, voids and empty spaces in the overlay imply that the solution is not as sophisticated as

that of Bodymetrics, suggesting that it can be used for styling and matching purposes but perhaps not for accurate sizing and fitting.

### 3.4. VIPodium from Fitting Reality

Moscow-based Fitting Reality [36] has created VIPodium, an AR fitting room application and shopping system which parses full body scanning image data to detect the physical outlines of a shopper and create a ShapeID, with which to query the product catalog of 3D virtual garments to offer pieces of clothing that perfectly fit that particular customer. A 3D interface allows intuitive navigation through the selected garments and item selection, after which a real-time video simulation of the customer "wearing" a 3D copy of a garment is created on screen so that the customer can assess the quality of fit and the style/matching aspects from multiple angles. VIPodium versions exist for home shoppers and for in-store usage (Fig. 2(d)). The former employs either Kinect for Windows connected to a computer/plasma TV or Kinect for Xbox hooked to an Xbox 360 console. For stores, VIPodium can be integrated in a shopping window to convert static retail fronts into interactive kiosks attracting attention to store brands, new collections and special offers. It can also function as a public apparel try-out place to enhance the shopping experience.

### 3.5. "Imagine That" on-line Virtual Fitting Room

The "Imagine That" [37] VFR moves along the lines of the previous solutions, providing 3D models of apparel, 360$^{o}$ views of the customer, a natural interaction user interface based on hand gesture recognition and social media integration. The in-store kiosk version uses a big-screen TV as a full-body mirror on which it projects a live video stream of the customer from the NI sensor's RGB camera or a created avatar of the customer as well as menus for navigating through the on-screen inventory. The customer can select various items to mix-and-match, narrow the selection and tag favorites to show sales staff for an actual try-on. The on-line version claims full integration with existing web sites and uses body scanning and analytics technologies for virtual try-on in the comfort of the customer's own home (Fig. 2(e)). Social media integration also enhances the shopping experience.

### 3.6. TryLive Eyewear from Total Immersion

Total Immersion [38] provides AR commercial solutions such as the D'Fusion Studio Suite which enables the development of secured AR applications across a variety of fields and domains (digital marketing, event organizations and industrial applications). Total Immersion has released various commercial AR platforms for web, mobile and kiosk deployment under a common TryLive logo: Virtual Fitting Room, Eyewear, Watches, Shoes and Jewellery. TryLive Eyewear, in particular, requires a camera-equipped computer, tablet or smart phone and uses automated face recognition algorithms such as face shape classification to filter through a large database of fashion or optical eyewear. Customers can virtually try on selected items, preview them interactively from various angles, interchange lenses and frames for a customized fit, filter out selections and populate a shopping cart (Fig. 2(f)). In addition, pictures can be sent to friends via Facebook, Twitter or other social media for feedback.

### 3.7. Apparel Manufacturing Made for You – AM4U

Styku [39] virtual body-scanning partnered with Tukatech Apparel Technology, Critical Mass Manufacturing and AIMS apparel management system to develop a "smart fitting room" that directly connects customers to design and manufacturing. Their business model is based on "demand manufacturing" and goes a step further from other solutions by allowing for a garment to be cut, sewn, and shipped to the customer based on their exact body measurements and personal design preferences.

Styku's smart fitting room is based on the Microsoft Kinect sensor to scan the shopper's body and create an avatar-like virtual model matching the shopper's dimensions. Using Tukatech's [40] TUKAcad and TUKA3D software, customers may virtually try on clothes, ascertain the quality of the fit, identify areas that might be too loose or too tight and alter a pattern to fit their body's measurements. Using Styku's customization tool, consumers can design their own garment in 3D while viewing the quality of fit on their own custom avatar.

The resulting design, customized both for fit and appearance, is sent off to fabric printers like Critical Mass, where it is printed and dyed using innovative waterless and chemical-free technology. In the final step, the fabrics are then sewn into garments using traditional automatic sewing machines, pressed, and delivered to the customer.

Demand manufacturing works well with digital fabric printing solutions which do not require liquid dyes. The process enables dyeing, printing and imprinting only the required amount of fabric on a single machine, with a quick turnaround eliminating overestimated production runs and excess inventory. In addition to speeding up manufacturing and reducing excess production, companies also save time by not having to halt the manufacturing process to clean the dye press. The process works on a per-garment basis to produce every garment separately at manufacturing speed and, as such, requires no minimum orders. In addition, by producing only the amount of apparel that is sold, retailers can minimize financial loss due to excess production.

## 4. CONCLUSIONS

Internet retailing is a modern concept with a plethora of potential advantages and challenges associated with electronic retailing (a discussion appears in [41]). Providing consumers with correctly-fitting clothes is a top business concern in the garment industry. Virtual Fitting Rooms (VFRs) promise to revolutionize the state of affairs in both retail and e-tail industries by letting customers try-on apparel and mix-and-match accessories without being physically present in the retail shop. Recent sophisticated VFRs provide long-awaited answers to fundamental shopper concerns like "does it suit" and "does it fit" and reduce much of the guesswork involved in shopping. Indeed, concerns about the quality of fit rank first in the list when it comes to consumer reluctance to purchase clothes on-line. It is not surprising that customers who actually try on clothes in fitting rooms have a conversion rate of 67%, compared to just 10% for those that do not [42]. In addition, return rates at a level of 15-50%, depending on the type of item, cause significant financial loss for online retailers. It is interesting to note that approximately 60% of these returns claim improper fit as the reason for the return.

By assuring prospective customers of a "perfect fit", VTRs remove an important obstacle for on-line shopping and become perfect vehicles for increased sales and decreased return rates. Modern VFRs combine AR technologies with depth and color data to provide robust body recognition functionality and successfully address the fit and suit aspects of shopping. The article discusses successful examples of VFRs as well as the enabling technologies behind some of these shopping and advertising tools, many of which employ full-body scans to offer only pieces of clothing with a satisfactory fit and at the same time facilitate the styling and matching aspects of shopping.

These platforms are not only powerful decision tools for on-line shopping but also contribute to the fun factor for in-store shopping. In addition, the incorporation of social media in VTRs allows shoppers to obtain quick advice and feedback (e.g., Tweeter, Facebook) for a more pleasing and interactive shopping experience. Smartphone applications can also alert nearby stores to wish-listed items so that local shopping and deal finding can be usefully combined.

## ACKNOWLEDGEMENTS

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# EXHIBIT 6

*EyesMatch Ltd. v. Samsung Elecs. Co. et al.*
2:23-cv-00363-JRG-RSP

The Wayback Machine - https://web.archive.org/web/20230205085313/https://gizmodo.com/microsoft-xbox-360-kinect-launc…



MICROSOFT

# Microsoft Xbox 360 Kinect Launches November 4

By Jason ChenPublished June 14, 2010 | Comments (43)

There will be 15 total launch titles when it hits on November 4. That includes the lightsaber battle game!

Watch

**Another Vortex Hits Texas | Extreme Earth**

**Netflix Passwords, ChatGPT Can't Detect AI, and No More CoTweets | Editor Picks**
Friday 1:15PM

**How Vinyl is Dominating Digital with Billboard's Lyndsey Havens | Techmodo**
Thursday 11:27AM

Here's the launch lineup.

TECH » MICROSOFT

The Wayback Machine - https://web.archive.org/web/20120311200255/http://blogs.msdn.com:80/b/kinectforwindows/archive/2012/01/09/kinect-for-windows-...

# Starting February 1, 2012: Use the Power of Kinect for Windows to Change the World

Kinect for Windows Team 9 Jan 2012 4:57 PM 50

We're thrilled at the sales we've seen for Kinect - 18 million sold in the past year – and we were honored to receive a Guinness World Record for the fastest selling consumer electronics device ever. As consumers, we may take devices like Kinect for granted, but in fact electronic devices are the fruit of a great deal of behind-the-scenes ingenuity and experimentation. Kinect is a shining example of this. Instead of mimicking the handheld motion-sensing controllers already on the market, Microsoft shattered the existing controller paradigm by inventing a new natural user interface system that enables advanced human tracking, gesture recognition, voice control and more. Our answer to the "wand" controller was no controller at all, or as we say, "YOU are the controller."

Getting there wasn't easy. Without many years of intense R&D efforts, including research investments of hundreds of millions of dollars, and the deep partnership between our research teams, software teams, hardware teams, manufacturing teams, and games studios, Kinect simply wouldn't exist. And as amazing a piece of hardware as Kinect is, it is much more than that. At the heart of the Kinect experience lies sophisticated software that meaningfully deciphers the images and gestures captured by the 3D sensor as well as the voice commands captured by the microphone array from someone much further away than someone using a headset or a phone. More importantly, Kinect software can understand what each user means by a particular gesture or command across a wide range of possible shapes, sizes, and actions of real people.

The incredible amount of innovation on Kinect for Xbox 360 this past year shows the potential for Kinect as a platform for developers and businesses to build new and innovative offerings. Along with many others, we have only begun to explore the potential of this amazing technology. This proliferation of creative and imaginative new ideas for Kinect, which we call the Kinect Effect, will expand even further with our commercial release of Kinect for Windows.

Today, we are announcing that the new Kinect for Windows hardware and accompanying software will be available on February 1st, 2012 in 12 countries (United States, Australia, Canada, France, Germany, Ireland, Italy, Japan, Mexico, New Zealand, Spain, United Kingdom), at a suggested retail price of US $249. Kinect for Windows hardware will be available, in limited quantities at first, through a variety of resellers and distributors. The price includes a one-year warranty, access to ongoing software updates for both speech and human tracking, and our continued investment in Kinect for Windows-based software advancements. Later this year, we will offer special academic pricing (planned at US $149) for Qualified Educational Users.

We love the innovation we have seen built using Kinect for Xbox 360 – this has been a source of inspiration and delight for us and compelled us to create a team dedicated to serving this opportunity. We are proud to bring technology priced in the tens of thousands of dollars just a few years ago to the mainstream at extremely low consumer prices. And although Kinect for Windows is still value-priced for the technology, some will ask us why it isn't the same price as Kinect for Xbox.

The ability to sell Kinect for Xbox 360 at its current price point is in large part subsidized by consumers buying a number of Kinect games, subscribing to Xbox LIVE, and making other transactions associated with the Xbox 360 ecosystem. In addition, the Kinect for Xbox 360 was built for and tested with the Xbox 360 console only, which is why it is not licensed for general commercial use, supported or under warranty when used on any other platform.

With Kinect for Windows, we are investing in creating a platform that is optimized for scenarios beyond the living room, and delivering new software features on an ongoing basis, starting with "near mode" (see my earlier blog post for more about this). In addition to support for Windows 7 and the Windows 8 developer preview (desktop apps only), Kinect for Windows will also support gesture and voice on Windows Embedded-based devices and will enhance how data is captured and accessed within intelligent systems across manufacturing, retail and many more industries. We are building the Kinect for Windows platform in a way that will allow other companies to integrate Kinect into their offerings and we have invested in an approach that allows them to develop in ways that are dependable and scalable.

We have chosen a hardware-only business model for Kinect for Windows, which means that we will not be charging for the SDK or the runtime; these will be available free to developers and end-users respectively. As an independent developer, IT manager, systems integrator, or ISV, you can innovate with confidence knowing that you will not pay license fees for the Kinect for Windows software or the ongoing software updates, and the Kinect for Windows hardware you and your customers use is supported by Microsoft.

Although we encourage all developers to understand and take advantage of the additional features and updates available with the new Kinect for Windows hardware and accompanying software, those developers using our SDK and the Kinect for Xbox

360 hardware may continue to use these in their development activities if they wish. However, non-commercial deployments using Kinect for Xbox 360 that were allowed using the beta SDK are not permitted with the newly released software. Non-commercial deployments using the new runtime and SDK will require the fully tested and supported Kinect for Windows hardware and software platform, just as commercial deployments do. Existing non-commercial deployments using our beta SDK may continue using the beta and the Kinect for Xbox 360 hardware; to accommodate this, we are extending the beta license for three more years, to June 16, 2016.

We expect that as Kinect for Windows hardware becomes readily available, developers will shift their development efforts to Kinect for Windows hardware in conjunction with the latest SDK and runtime. The combination of Kinect for Windows hardware and software creates a superior development platform for Windows and will yield a higher quality, better performing experience for end users.

We are excited for the new possibilities that Kinect will enable on the Windows platform, and to see how businesses and developers reimagine their processes and their products, and the many different ways each Kinect could enrich lives and make using technology more natural for everyone.

*Craig Eisler*
*General Manager, Kinect for Windows*

## Comments

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