

# Literaturverzeichnis

- 3Dconnexion. (2012). *SpaceMouse Pro*. [Website]. Verfügbar unter: <http://www.3dconnexion.com/index.php?id=271> [06. 04. 2014].
- Abeele, V. V., Schutter, B. D., Gajadhar, B. & Johnson, D. (2013). *More Naturalness, Less Control: The Effect of Natural Mapping on the Co-located Player Experience*. Paper presented at the 8th International Conference on the Foundations of Digital Games, Chania, Crete, Greece.
- Adachi, I. (2014). Spontaneous Spatial Mapping of Learned Sequence in Chimpanzees: Evidence for a SNARC-Like Effect. *PLoS One*, 9(3), e90373.
- Adams, E. (2004). The Designer's Notebook: Postmodernism and the 3 Types of Immersion, *Gamasutra. The Art & Business of Making Games* (S. 1).
- Aflaki, P., Hannuksela, M. M., Sarbolandi, H. & Gabbouj, M. (2014). Simultaneous 2D and 3D perception for stereoscopic displays based on polarized or active shutter glasses. *Journal of Visual Communication and Image Representation*, 25(4), 622-631.
- Agarwal, R. & Karahanna, E. (2000). Time flies when you're having fun. Cognitive Absorption and beliefs about information technology use. *MIS Quarterly*, 24(4), 665–994.
- al-Azzawi, A. (2014). *Experience with Technology*. London: Springer.
- Alcron, A. (1972). Pong [Video Game]. Sunnyvale, CA: Atari Inc.
- Anderson, R. C. (1977). The notion of schemata and the educational enterprise: general discussion of the conference. In R. C. Anderson & W. E. Montague (Hrsg.), *Schooling and the acquisition of knowledge* (S. 415–431). Hillsdale, NJ: Lawrence Erlbaum.
- Anderson, S. & Hauck, W. W. (1983). A new procedure for testing equivalence in comparative bioavailability and other clinical trials. *Communications in Statistics - Theory and Methods*, 12(23), 2663-2692.
- Arthur, K. W., Booth, K. S. & Ware, C. (1993). Evaluating 3D task performance for fish tank virtual worlds. *ACM Transactions on Information Systems*, 11(3), 239-265.
- Atari Inc. (1973). Space Race (Version Arcade) [Video Game]. Sunnyvale, CA: Atari Inc.
- Aymerich-Franch, L., Karutz, C. & Bailenson, J. (2012). *Effects of Facial and Voice Similarity on Presence in a Public Speaking Virtual Environment* Paper presented at the International Conference on Presence, ISPR 2012, Philadelphia, PA.
- Baddeley, A. D. (1986). *Working Memory*. New York, NY: Oxford University Press.
- Bai, H., Gao, L., El-Sana, J. & Billinghamurst, M. (2013, November 19-22, 2013). *Markerless 3D gesture-based interaction for handheld augmented reality interfaces*. Paper presented at the SIGGRAPH Asia 2013 Symposium on Mobile Graphics and Interactive Applications, SA'13, Hongkong, CN.

- Balakrishnan, B. & Sundar, S. S. (2011). Where Am I? How Can I Get There? Impact of Navigability and Narrative Transportation on Spatial Presence. *Human-Computer Interaction*, 26(3), 161-204.
- Banos, R. M., Botella, C., Rubio, I., Quero, S., Garcia-Palacios, A. & Alcaniz, M. (2008). Presence and emotions in virtual environments: the influence of stereoscopy. *Cyberpsychol Behav*, 11(1), 1-8.
- Baren, J. v. & Ijsselsteijn, W. (2004). *Measuring presence: A guide to current measurement approaches*. Verfügbar unter: <http://www8.informatik.umu.se/~jwworth/PresenceMeasurement.pdf> [27 October 2013].
- Barfield, W., Baird, K. M. & Bjorneseth, O. J. (1998). Presence in virtual environments as a function of type of input device and display update rate. *Displays*, 19(2), 91-98.
- Barfield, W. & Furness, T. A. I. (1995). *Virtual Environments and advanced interface design*. New York: Oxford University Press.
- Barfield, W., Hendrix, C. & Bystrom, K.-E. (1999). Effects of Stereopsis and Head Tracking on Performance Using Desktop Virtual Environment Displays. *Presence: Teleoperators and Virtual Environments*, 8(2), 237-240.
- Barfield, W. & Weghorst, S. (1993). The Sense of Presence within Virtual Environments: A Conceptual Framework. In G. Salvendy & M. Smith (Hrsg.), *Software and Hardware Interfaces* (S. 699-704). Amsterdam: Elsevier.
- Barfield, W., Zeltzer, D., Sheridan, T. & Slater, M. (1995). Presence and performance within virtual environments. In W. Barfield & T. A. I. Furness (Hrsg.), *Virtual environments and advanced interface design* (S. 474-513). New York, NY: Oxford University Press.
- Barsalou, L. W., Kyle Simmons, W., Barbey, A. K. & Wilson, C. D. (2003). Grounding conceptual knowledge in modality-specific systems. *Trends in Cognitive Sciences*, 7(2), 84-91.
- Bartle, R. (2004). *Designing virtual worlds*. Berkeley, CA: New Riders.
- Benford, S., Bowers, J., Fahl, L., Greenhalgh, C. & Snowdon, D. (1995). *User Embodiment in Collaborative Virtual Environments*. Paper presented at the Human Factors in Computing Systems, CHI'95, Denver, CO.
- Bernhaupt, R. (Hrsg.). (2010). *Evaluating user experience in games. Concepts and Methods*. London: Springer London.
- Bertozi, E. & Lee, S. (2007). Not Just Fun and Games: Digital Play, Gender and Attitudes Towards Technology. *Women's Studies in Communication*, 30(2), 179-204.
- Big Park. (2010). Kinect Joy Ride [Video Game]. Redmond, WA: Microsoft Game Studios.
- Biocca, F. (1992). Virtual Reality Technology: A Tutorial. *Journal of Communication*, 42(4), 23-72.
- Biocca, F. (1997). The cyborg's dilemma: Embodiment in virtual environments. In T. Kunii, J. L. Mey, B. Gorayska, J. P. March & C. J. Nehaniv (Hrsg.), *Proceedings of the 2nd International Conference on Cognitive Technology (CT '97)* (S. 12-26). Washington: IEEE Computer Society.
- Biocca, F. (2003). *Can we resolve the book, the physical reality and the dream state problems? From the two-pole to a three-pole model of shifts in presence*. Paper

- presented at the EU Future and Emerging Technologies, Presence Initiative Meeting, Venice, MI.
- Biocca, F. & Delaney, B. (1995). Immersive virtual reality technology. In F. Biocca & M. R. Levy (Hrsg.), *Communication in the age of virtual reality* (S. 57-124). Hillsdale, NJ: Erlbaum.
- Bischof, A., Obländer, V., Heidt, M., Kanellopoulos, K., Kuszter, V., Liebold, B. et al. (2013). *Interdisziplinäre Impulse für den Begriff "Interaktion"*. Paper presented at the Informationswissenschaft zwischen virtueller Infrastruktur und materiellen Lebenswelten. Tagungsband des 13. Internationalen Symposiums für Informationswissenschaft (ISI 2013), Potsdam.
- Bjork, R. (1978). The updating of human memory. In G. H. Bower (Hrsg.), *The Psychology of Learning and Motivation* (Bd. 12). New York, NY: Academic Press.
- Böcking, S., Gysbers, A., Wirth, W., Klimmt, C., Hartmann, T., Schramm, H. et al. (2004). Theoretical and empirical support for distinction between components and conditions of spatial presence, *7th International Workshop on Presence, PRESENCE 2004*. Valecia, SP.
- Böcking, S. & Wirth, W. (2009). Towards Conceptualizing Suspension of Disbelief for Communication Research, *International Communication Association, ICA 2009*. New York, NY.
- Bombeke, K., Van Looy, J., Szmalec, A. & Duyck, W. (2013). Leaving the third dimension: No measurable evidence for cognitive aftereffects of stereoscopic 3D movies. *Journal of the Society for information display*, 21(4), 159-166.
- Bortz, J. & Schuster, C. (2010). *Statistik für Human- und Sozialwissenschaftler*. Berlin Heidelberg: Springer.
- Botvinick, M. & Cohen, J. (1998). Rubber hands 'feel' touch that eyes see. *Nature*, 391(6669), 756.
- Bowman, D. A., Kruijff, E., LaViola, J. J. & Poupyrev, I. (2004). *3D User Interfaces: Theory and Practice*. Boston, MA: Addison-Wesley Professional.
- Boyan, A. (2009). Challenge and Video Game Play: Aligning Mental Models With Game Models, *Annual Meeting of the International Communication Association, ICA 2009*. Marriott, Chicago, IL.
- Bracken, C. C. & Skalski, P. (2006, August 24-26, 2006). *Presence and video games: The impact of image quality and skill level*. Paper presented at the Ninth Annual International Workshop on Presence, Cleveland, OH, USA.
- Bracken, C. C. & Skalski, P. (2009). Presence Reactions to Video Games: The Impact of Image Quality and Skill Level. *Annual meeting of the International Communication Association*. News York City, NY, USA.
- Braitenberg, V. (1984). *Vehicles: Experiments in synthetic psychology*. Cambridge, MA: MIT Press.
- Breuer, J., Scharnow, M. & Quandt, T. (2013). Sore Losers? A Reexamination of the Frustration-Aggression Hypothesis for Colocated Video Game Play. *Psychology of Popular Media Culture*.
- Broadbent, D. E. (1958). *Perception and communication*. London, UK: Pergamon.
- Brockmyer, J. H., Fox, C. M., Curtiss, K. A., McBroom, E., Burkhart, K. M. & Pidruzny, J. N. (2009). The development of the Game Engagement Questionnaire: A measure

- of engagement in video game-playing. *Journal of Experimental Social Psychology*, 45(4), 624-634.
- Brogni, A., Vinayagamoorthy, V., Steed, A. & Slater, M. (2006). *Variations in physiological responses of participants during different stages of an immersive virtual environment experiment*. Paper presented at the ACM Symposium on Virtual Reality Software and Technology, Limassol, Cyprus.
- Brooke, J. (1996). SUS: a "quick and dirty" usability scale. In P. W. Jordon, B. Thomas, B. A. Weerdmeester & A. L. McClelland (Hrsg.), *Usability Evaluation in Industry*. London: Taylor and Francis.
- Brown, C. (2013). How 'Minority Report' Trapped Us In A World Of Bad Interfaces, *The AWL USA*.
- Brown, E. & Cairns, P. (2004). A grounded investigation of game immersion. In E. Dykstra-Erickson & M. Tscheligi (Hrsg.), *CHI '04 Extended Abstracts on Human Factors in Computing Systems* (S. 1297-1300). New York, NY: ACM Press.
- Bruner, J. S. & Postman, L. E. O. (1949). On the Perception of Incongruity: A Paradigm. *Journal of Personality*, 18(2), 206-223.
- Bugbear Entertainment Ltd. (2007). Flatout: Ultimate Carnage [Video Game]. London, UK: Empire Interactive Entertainment.
- Bühner, M. (2006). *Einführung in die Test- und Fragebogenkonstruktion*. München: Pearson.
- Butcher, K. R. (2006). Learning from text with diagrams: Promoting mental model development and inference generation. *Journal of Educational Psychology*, 98(1), 182-197.
- Cameron, J. (Writer) (2009). Avatar [DVD]: Twentieth Century Fox.
- Candy, L. & Ferguson, S. (Hrsg.). (2014). *Interactive Experience in the Digital Age*. Cham, Heidelberg, New York, Dordrecht, London: Springer International.
- Capcom. (2009). Resident Evil 5 [Video Game]. San Mateo County, CA: Capcom.
- Carr, D. & Oliver, M. B. (2010). Second Life, Immersion, and Learning. In P. Zaphiris & C. S. Ang (Hrsg.), *Social computing and virtual communities* (S. 205-223). Boca Raton: CRC Press.
- Castle, A. (2009). Build Your Own Multitouch Surface Computer, *MaximumPC*.
- Chapanis, A. & Lindenbaum, L. E. (1959). A reaction time study of four control-display linkages. *Human Factors*, 1(nov 1959), 1-7.
- Chen, M., Koldo, B., Cuddihy, E. & Medina, E. (2005). *Modelling and measuring engagement in computer games*. Paper presented at the Digital Games Research Conference 2005, Changing Views: Worlds in Play, DiGRA 2005, Vancouver, CA.
- Cho, S., Ku, J., Cho, Y. K., Kim, I. Y., Kang, Y. J., Jang, D. P. et al. (2014). Development of virtual reality proprioceptive rehabilitation system for stroke patients. *Comput Methods Programs Biomed*, 113(1), 258-265.
- Clark, N. (2010). The Sensible Side of Immersion, *Gamasutra. The Art & Business of Making Games* (S. 1-3).
- Cohen, A. R., Lohani, S., Manjila, S., Natsupakpong, S., Brown, N. & Cavusoglu, M. C. (2013). Virtual reality simulation: basic concepts and use in endoscopic neurosurgery training. *Childs Nerv Syst*, 29(8), 1235-1244.

- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd). Hillsdale, NJ: Lawrence Erlbaum.
- ColdWood Interactive. (2010). *The Fight: Lights Out* [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Coleridge, S. T. (1817). *Biographia Literaria*.
- Costa, M. R., Kim, S. Y. & Biocca, F. (2013). *Embodiment and Embodied Cognition*. Paper presented at the 5th International Conference, VAMR 2013, Held as Part of HCI International 2013, Las Vegas, NV, USA, July 21-26, 2013, Proceedings, Part I.
- Costantini, M. & Haggard, P. (2007). The rubber hand illusion: sensitivity and reference frame for body ownership. *Conscious Cogn*, 16(2), 229-240.
- Courtney, M. G. R. (2013). Determining the Number of Factors to Retain in EFA: Using the SPSS R-Menu v2.0 to Make More Judicious Estimations *Practical Assessment, Research & Evaluation*, 18(8).
- Craik, F. I. & Byrd, M. (1982). ging and cognitive deficits. The role of attentional resources. In F. I. Craik & S. Trehub (Hrsg.), *Advances in the study of communication and affect*. New York, NY: Plenum Press.
- Craik, K. (1943). *The nature of explanation*. Cambridge: Cambridge University Press.
- Cruz-Neira, C., Sandin, D. J. & DeFanti, T. A. (1993). Surround-screen projection-based virtual reality. 135-142.
- Crytek. (2007). *Crysis* [Video Game]. Redwood City, CA: Electronic Arts.
- Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play*. San Francisco: Jossey-Bass.
- Cudeck, R. & Browne, M. W. (1983). Cross-Validation of Covariance-Structures. *Multivariate Behavioral Research*, 18(2), 147-168.
- Cutting, E. & Vishton, P. M. (1995). Perceiving layout and knowing distances: The interaction of relative potency, and contextual use of different information about depth. In W. Epstein & S. Rogers (Hrsg.), *Perception of space and motion*. San Diego, CA: Academic Press.
- Cutting, J. E. (1997). How the eye measures reality and virtual reality. *Behavior Research Methods, Instruments, & Computers*, 29(1), 27-36.
- Damasio, A. R. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*. New York, NY: Putnam.
- Darken, R. P., Cockayne, W. R. & Carmein, D. (1997). *The omni-directional treadmill: A locomotion device for virtual worlds*. Paper presented at the Proceedings of ACM UIST.
- Davis, E. T. & Hodges, L. F. (1995). Human stereopsis, fusion, and stereoscopic virtual environments. In W. Barfield & T. A. I. Furness (Hrsg.), *Virtual Environments and Advances Interface Design* (S. 145-174). Oxford, GB: Oxford University Press.
- Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Manage Sci*, 35(8), 982-1003.
- Davis, R. (2006). *Wii Sports Review*, *Gamespot*. San Francisco, CA: CBS Interactive.
- De Kort, Y. A. W., iJsselsteijn, W. A. & Poels, K. (2007, October 25-27, 2007). *Digital games as social presence technology : development of the social presence in gaming*

- questionnaire (SPGQ)*. Paper presented at the 10th Annual International Workshop on Presence, PRESENCE 2007, Barcelona, SP.
- de Rijk, A. E., Schreurs, K. M. G. & Bensing, J. M. (1999). *Journal of Behavioral Medicine*, 22(6), 549-573.
- Dean, G. M. & Morris, P. E. (2003). The relationship between self-reports of imagery and spatial ability. *Br J Psychol*, 94(Pt 2), 245-273.
- DeVellis, R. F. (2012). *Scale development: Theory and applications* (3). Los Angeles, CA, USA: Sage.
- Dicke, C., Jakus, G., Tomazic, S. & Sodnik, J. (2012, 30.01.-04.02. 2012). *On the Evaluation of Auditory and Head-up Displays While Driving*. Paper presented at the ThinkMind // ACHI 2012, The Fifth International Conference on Advances in Computer-Human Interactions, Valencia, Spain.
- Dodge, M., Kitchin, R. & Perkins, C. (Hrsg.). (2011). *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Oxford, UK: John Wiley & Sons.
- Donaldson, T. (1968). Robustness of the F-test to errors of both kinds and the correlation between the numerator and denominator of the F-ratio. *American Statistical Journal*, 660-676.
- Dörner, R., Broll, W., Grimm, P. & Jung, B. (Hrsg.). (2013). *Virtual und Augmented Reality (VR/AR). Grundlagen und Methoden der Virtuellen und Augmentierten Realität*. Berlin, Heidelberg: Springer.
- Dörner, R., Geiger, C., Oppermann, L. & Paelke, V. (2013). Interaktion in Virtuellen Welten. In R. Dörner, W. Broll, P. Grimm & B. Jung (Hrsg.), *Virtual und Augmented Reality (VR/AR). Grundlagen und Methoden der Virtuellen und Augmentierten Realität* (S. 157-195). Berlin, Heidelberg: Springer.
- Dörner, R. & Steinicke, F. (2013). Wahrnehmungsaspekte von VR. In R. Dörner, W. Broll, P. Grimm & B. Jung (Hrsg.), *Virtual und Augmented Reality (VR/AR). Grundlagen und Methoden der Virtuellen und Augmentierten Realität* (S. 33-63). Berlin, Heidelberg: Springer.
- Douglas, Y. & Hargadon, A. (2000). The pleasure principle: Immersion, engagement, flow. In F. M. Shipman, P. J. Nürnberg & D. L. Hicks (Hrsg.), *Hypertext '00 – Proceedings of the eleventh ACM on hypertext and hypermedia* (S. 153–160). New York, NY: ACM Press.
- Dourish, P. (2001). *Where the Action is: The Foundations of Embodied Interaction*. Boston, MA: MIT Press.
- Downs, E. P. & Oliver, M. B. (2009). How can Wii learn from video games? Examining relationships between technological affordances and socio-cognitive determinates on affective and behavioral outcomes. *Annual Meeting of the International Communication Association, APA*. Marriott, Chicago, IL.
- Downs, R. M. & Stea, D. (2011). Cognitive Maps and Spatial Behavior: Process and Products. In M. Dodge, R. Kitchin & C. Perkins (Hrsg.), *The Map Reader: Theories of Mapping Practice and Cartographic Representation* (S. 312-317). Oxford, UK: John Wiley & Sons.
- Draper, J. V., Kaber, D. B. & Usher, J. M. (1998). Telepresence. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 40(3), 354–375.

- Durlak, J. T. (1987). A typology for interactive media. In M. L. McLaughlin (Hrsg.), *Communication Yearbook 10* (S. 743-757). Newbury Park: Sage.
- Dutke, S. (1994). *Mentale Modelle: Konstrukte des Wissens und Verstehens. Kognitionspsychologische Grundlagen für die Software-Ergonomie*. Göttingen: Verlag für angewandte Psychologie.
- Dyck, J., Pinelle, D., Brown, B. & Gutwin, C. (2003, 11-13 Juni 2003). *Learning from Games: HCI Design Innovations in Entertainment Software*. Paper presented at the Graphics Interface, Halifax, Nova Scotia, CA.
- EA Canada. (2000). *SSX (Version PlayStation 2)* [Video Game]. Redwood City, CA: Electronic Arts.
- EA Tiburon. (2007a). *Madden NFL 08* [Video Game]. Redwood City, CA: Electronic Arts.
- EA Tiburon. (2007b). *Tiger Woods PGA Tour 08 (Version Nintendo Wii)* [Video Game]. Redwood City, CA: Electronic Arts.
- EA Tiburon. (2010). *Tiger Woods PGA Tour 11* [Video Game]. Vancouver, CA: EA Sports.
- Ebner, M., Stickel, C., Scerbakov, N. & Holzinger, A. (2009). A Study on the Compatibility of Ubiquitous Learning (u-Learning) Systems at University Level. *5616*, 34-43.
- Ekstrom, R. B., French, J. W. & Harman, H. H. (1976). *Manual for kit of factor-referenced cognitive tests*. Princeton: Educational Testing Service.
- Electronic Arts Black Box. (2003). *Need for Speed Underground* [Video Game]. Redwood City, CA: Electronic Arts.
- Electronic Arts Black Box. (2004). *Need for Speed Underground 2*. Redwood City, CA: Electronic Arts.
- Electronic Arts Black Box. (2007). *Need for Speed: Pro Street* [Video Game]. Redwood City, CA: Electronic Arts.
- Electronic Arts Montreal. (2009). *Need for Speed: Nitro (Version Nintendo Wii)* [Video Game]. Redwood City, CA: Electronic Arts.
- Electronic Arts Redwood. (2006). *Tiger Woods PGA Tour 07*. Redwood City, CA: Electronic Arts.
- Elson, M., van Looy, J., Vermeulen, L. & Van den Bosch, F. (2012). In the mind's: No Evidence for an effect of stereoscopic 3D on user experience of digital games, *ECCREA ECC 2012 preconference Experiencing Digital Games: Use, Effects & Culture of Gaming*. Istanbul, Turkey.
- Engel, D., Curio, C., Tcheang, L., Mohler, B. & Bühlhoff, H. H. (2008). *A psychophysically calibrated controller for navigating through large environments in a limited free-walking space*. Paper presented at the 15th ACM Symposium on Virtual Reality Software and Technology (VRST 2008), New York, NY.
- Farah, M. J., Hammond, K. M., Levine, D. N. & Calvanio, R. (1988). Visual and spatial mental imagery: Dissociable systems of representation. *Cognitive Psychology*, *20*(4), 439-462.
- Farrell Pagulayan, K., Busch, R. M., Medina, K. L., Bartok, J. A. & Krikorian, R. (2006). Developmental normative data for the Corsi Block-tapping task. *J Clin Exp Neuropsychol*, *28*(6), 1043-1052.



- Feenstra, H., Ruiter, R. A. & Kok, G. (2010). Social-cognitive correlates of risky adolescent cycling behavior. *BMC Public Health*, 10, 408.
- Felnhofer, A. & Kothgassner, O. D. (Hrsg.). (2014). *Challenging Presence. Proceedings of the International Society for Presence Research. 15th International Conference on Presence*. Vienna, AU: facultas.
- Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics* (4). London; Thousand Oaks, CA, USA: Sage.
- Finstad, K. (2010). The Usability Metric for User Experience. *Interacting with Computers*, 22(5), 323-327.
- Fischbach, M., Wiebusch, D., Latoschik, M. E., Bruder, G. & Steinicke, F. (2012). *smARTbox: A Portable Setup for Intelligent Interactive Applications*. Paper presented at the Mensch und Computer Demo Papers, Konstanz.
- Fontaine, G. (1992). The experience of a sense of presence in intercultural and international encounters. *Presence: Teleoperators & Virtual Environments*, 1(4), 482-490.
- Foreman, N. & Gillett, R. (1998). Visual-spatial skill and standard psychometric tests. In N. Foreman & R. Gillett (Hrsg.), *A Handbook of Spatial Research Paradigms and Methodologies: Clinical and Comparative Studies* (Bd. 1). East Sussex, UK: Psychology Press.
- Forster, W. (Hrsg.). (2004). *Gameplan 2: Joysticks: Eine illustrierte Geschichte der Game-Controller 1972-2004*. Utting: Gameplan.
- Freeman, J. (2004). Implications for the measurement of presence from convergent evidence on the structure of presence, *ICA 2004*. New Orleans, USA.
- Freeman, J., Avons, S. E., Meddis, R., Pearson, D. E. & Jjsselsteijn, W. (2000). Using Behavioral Realism to Estimate Presence: A Study of the Utility of Postural Responses to Motion Stimuli. *Presence: Teleoperators and Virtual Environments*, 9(2), 149-164.
- Friedman, N. P. & Miyake, A. (2000). Differential roles for visuospatial and verbal working memory in situation model construction. *Journal of Experimental Psychology: General*, 129(1), 61-83.
- Froehlich, B., Hochstrate, J., Skuk, V. & Huckauf, A. (2006). *The GlobeFish and the GlobeMouse*. Paper presented at the SIGCHI Conference on Human Factors in Computing Systems, CHI'06, Montreal, CA.
- Frozenbyte. (2009). *Trine* [Video Game]. Helsinki, FI: Frozenbyte.
- Gallup, G. G. (1970). Chimpanzees: self-recognition. *Science*, 167, 86-87.
- Gander, P. (1999). *Two myths about immersion in new storytelling media*. Verfügbar unter: [http://www.pierregander.com/research/two\\_myths\\_about\\_immersion.pdf](http://www.pierregander.com/research/two_myths_about_immersion.pdf).
- George, D. & Mallery, P. (2003). *SPSS for Windows Step by Step: A Simple Guide and Reference. 11.0 update (4th ed.)*. Boston: Allyn & Bacon.
- Gerrig, R. J. (1993). *Experiencing narrative worlds*. New Haven, CT: Yale University Press.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin.
- Giraldi, G. A., Silva, R. & Oliveira, J. C. (2003). *Introduction to Virtual Reality* (Technical Report 06/2003). Brazil: LNCC.



- Glass, G. V., Peckham, P. D. & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying fixed effects analyses of variance and covariance. *Rev. Education Res.*, 42, 237-288.
- Glenberg, A. M. (1997). What memory is for. *Behavioral and Brain Sciences*, 20(1), 1-55.
- Glenberg, A. M., Meyer, M. & Lindem, K. (1987). Mental models contribute to foregrounding during text comprehension. *Journal of Memory and Language*, 26(1), 69-83.
- Graesser, A. C., Singer, M. & Trabasso, T. (1994). Constructing inferences during narrative text comprehension. *Psychological Review*, 101(3), 371-395.
- Green, M. C. & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, 79(5), 701-721.
- Green, M. C., Brock, T. C. & Kaufman, G. F. (2004). Understanding media enjoyment: The role of transportation into narrative worlds. *Communication Theory*, 14(4), 311-327.
- Grimm, P., Herold, R., Hummel, J. & Broll, W. (2013). VR-Eingabegeräte. In R. Dörner, W. Broll, P. Grimm & B. Jung (Hrsg.), *Virtual und Augmented Reality (VR/AR). Grundlagen und Methoden der Virtuellen und Augmentierten Realität* (S. 97-127). Berlin, Heidelberg: Springer.
- Grimm, P., Herold, R., Reiners, D. & Cruz-Neira, C. (2013). VR-Ausgabegeräte. In R. Dörner, W. Broll, P. Grimm & B. Jung (Hrsg.), *Virtual und Augmented Reality (VR/AR). Grundlagen und Methoden der Virtuellen und Augmentierten Realität* (S. 127-157). Berlin, Heidelberg: Springer.
- Gysbers, A., Klimmt, C., Hartmann, T., Nosper, A. & Vorderer, P. (2004). Exploring the book problem: Text design, mental representations of space and spatial presence in readers, *7th International Workshop on Presence, PRESENCE 2004*. Valencia, SP.
- Haans, A. (2014). *In Search of the Fixed Points on the Presence Scale*. Paper presented at the Challenging Presence. International Society for Presence Research, ISPR 2014, Vienna, AU.
- Haans, A. & Ijsselstein, W. A. (2012). Embodiment and telepresence: Toward a comprehensive theoretical framework. *Interacting with Computers*, 24(4), 211-218.
- Haber, H. F. & Weiss, G. (Hrsg.). (1999). *Perspectives on Embodiment: The Intersections of Nature and Culture*. London, UK: Routledge.
- Häcker, H. O. & Stapf, K.-H. (2009). *Dorsch Psychologisches Wörterbuch* (15. Edition). Bern: Huber.
- Haenggi, D., Kintsch, W. & Gernsbacher, M. A. (1995). Spatial situation models and text comprehension. *Discourse Processes*, 19(2), 173-199.
- Hagendorf, H., Kruppenacher, J., Müller, H. J. & Schubert, T. (2011). *Wahrnehmung und Aufmerksamkeit*. Berlin: Springer Medizin.
- Häkkinen, J., Pölönen, M., Takatalo, J. & Nyman, G. (2006). Simulator sickness in virtual display gaming: A comparison of stereoscopic and non-stereoscopic situations, *8th International Conference on Human Computer Interaction with Mobile Devices and Services* Helsinki, Finland.
- Hart, S. & Staveland, L. (1988). Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In P. Hancock & N. Meshkati (Hrsg.), *Human mental workload* (S. 139-183). Amsterdam: North Holland.

- Hartley, H. O. (1950). The Use of Range in Analysis of Variance. *Biometrika*, 39, 271-280.
- Hartmann, T. & Reinecke, L. (2013). Skalenkonstruktion in der Kommunikationswissenschaft. In W. Möhring & D. Schlütz (Hrsg.), *Handbuch standardisierte Erhebungsverfahren in der Kommunikationswissenschaft* (S. 41-61). Wiesbaden: Springer VS.
- Hassenzahl, M., Burmester, M. & Koller, F. (2003). *AttrakDiff: A questionnaire for measuring perceived hedonistic and pragmatic quality*. [AttrakDiff: Ein Fragebogen zur Messung wahrgenommener hedonischer und pragmatischer Qualität]. Paper presented at the Mensch & Computer 2003. Interaktion in Bewegung, Stuttgart, Leipzig.
- Hassenzahl, M., Eckoldt, K. & Thielsch, M. T. (2009). *User Experience und Experience Design - Konzepte und Herausforderungen*. Paper presented at the Usability Professionals 2009, 7. Workshop German Chapter of Usability Professionals Association, Stuttgart.
- Havranek, M., Langer, N., Cheetham, M. & Jancke, L. (2012). Perspective and agency during video gaming influences spatial presence experience and brain activation patterns. *Behav Brain Funct*, 8, 34.
- Hayashi, A., Chen, C., Ryan, T. & Wu, J. The Role of Social Presence and Moderating Role of Computer Self Efficacy in Predicting the Continuance Usage of E-Learning Systems. *Journal of Information Systems Education*, 15(2), 139.
- Heeter, C. (1992). Being there: The subjective experience of presence. *Presence: Teleoperators & Virtual Environments*, 1(2), 262-271.
- Hegarty, M., Montello, D. R., Richardson, A. E., Ishikawa, T. & Lovelace, K. (2006). Spatial abilities at different scales: Individual differences in aptitude-test performance and spatial-layout learning. *Intelligence*, 34(2), 151-176.
- Held, R. M. & Durlach, N. I. (1992). Telepresence. *Presence: Teleoperators and Virtual Environments*, 1(1), 109-112.
- Hendrix, C. & Barfield, W. (1995). Relationship between monocular and binocular depth cues for judgements of spatial information and spatial instrument design. *Displays*, 16, 103-113.
- Hesslow, G. (2002). Conscious thought as simulation of behaviour and perception. *Trends in Cognitive Sciences*, 6(6), 242-247.
- Hirose, M., Hirota, K. & Kijima, R. (1992). Human behavior in virtual environments. *Human Vision, Visual Processing, and Digital Display III, SPIE*, 1666, 548-559.
- Hofer, M., Wirth, W., Kuehne, R., Schramm, H. & Sacau, A. (2012). Structural Equation Modeling of Spatial Presence: The Influence of Cognitive Processes and Traits. *Media Psychology*, 15(4), 373-395.
- Hoffman, D. D. (2003). *Visuelle Intelligenz. Wie die Welt im Kopf entsteht*. München: dtv.
- Hoffman, D. M., Girshick, A. R., Akeley, K. & Banks, M. S. (2008). Vergence-accommodation conflicts hinder visual performance and cause visual fatigue. *Journal of Vision*, 8(3), 33.31-33.30.
- Hommel, B., Müsseler, J., Aschersleben, G. & Prinz, W. (2001). The theory of event coding (TEC): A framework of perception and action. *Behavioral and Brain Sciences*, 24(4), 869-937.

- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30, 179-185.
- Howarth, P. A. (2011). Potential hazards of viewing 3-D stereoscopic television, cinema and computer games: a review. *Ophthalmic Physiol Opt*, 31(2), 111-122.
- Hubona, G. S., Wheeler, P. N., Shirah, G. W. & Brandt, M. (1999). The relative contributions of stereo, lighting, and background scenes in promoting 3D depth visualization. *ACM Transactions on Computer-Human Interaction*, 6(3), 214-242.
- Hunt, C. G., Houtman, C. J., Jones, D. C., Kitin, P., Korripally, P. & Hammel, K. E. (2013). Spatial mapping of extracellular oxidant production by a white rot basidiomycete on wood reveals details of ligninolytic mechanism. *Environ Microbiol*, 15(3), 956-966.
- Hürst, W. & Wezel, C. (2012). Gesture-based interaction via finger tracking for mobile augmented reality. *Multimedia Tools and Applications*, 62(1), 233-258.
- Hutcheson, G. & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. London; Thousand Oaks, CA, USA: Sage.
- id Software. (1999). *Quake III: Arena* [Video Game]. Santa Monica, CA: Activision.
- Idol Minds. (2007). *PAIN* [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Ijsselsteijn, W., de Kort, Y. A. W. & Poels, K. (in Vorbereitung). The Game Experience Questionnaire: Development of a self-report measure to assess the psychological impact of digital games.
- Ijsselsteijn, W., De Kort, Y. A. W., Poels, K., Jurgelionis, A. & Bellotti, F. (2007). *Characterising and measuring user experiences in digital games*. Paper presented at the International Conference on Advances in Computer Entertainment Technology (ACE 2007), Salzburg, AU.
- Ijsselsteijn, W., Ridder, H. d., Freeman, J., Avons, S. E. & Bouwhuis, D. (2001). Effects of Stereoscopic Presentation, Image Motion, and Screen Size on Subjective and Objective Corroborative Measures of Presence. *Presence: Teleoperators and Virtual Environments*, 10(3), 298-311.
- International Society for Presence Research. (2000). *The Concept of Presence: Explication Statement* Verfügbar unter: <http://ispr.info/> [25 September 2013]
- Iversen, H. & Rundmo, T. (2004). Attitudes towards traffic safety, driving behaviour and accident involvement among the Norwegian public. *Ergonomics*, 47(5), 555-572.
- Izard, C. E. (1993). *The Differential Emotions Scale: DES IV-A; [a Method of Measuring the Meaning of Subjective Experience of Discrete Emotions]*: University of Delaware.
- Jacko, J. A. (Hrsg.). (2012). *The Human-Computer Interaction Handbook. Fundamentals, Evolving Technologies, and Emerging Applications* (3rd ed.). Boca Balton, FL: CRC Press, Taylor & Francis.
- James, W. (1890). *The Principles of Psychology*. New York: Holt.
- Jefferies, M. E. & Yeap, W. K. (2008). Robot and Cognitive Approaches to Spatial Mapping. In M. E. Jefferies & W. K. Yeap (Hrsg.), *Robot and Cognitive Approaches to Spatial Mapping* (Bd. 38, S. 1-5). Berlin, Heidelberg: Springer.
- Jennett, C., Cox, A. L., Cairns, P., Dhoparee, S., Epps, A., Tijs, T. et al. (2008). Measuring and defining the experience of immersion in games. *International Journal of Human-Computer Studies*, 66(9), 641-661.

- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference, and consciousness*. Cambridge: Cambridge University Press.
- Johnson-Laird, P. N. (2004). The history of mental models. In K. Manktelow & M. C. Chung (Hrsg.), *Psychology of reasoning: Theoretical and historical perspectives* (S. 179-212). New York: Psychology Press.
- Johnson, D., Gardner, J., Wiles, J., Sweetser, P. & Hollingsworth, K. (2003). *The Inherent Appeal of Physically Controlled Peripherals*. Paper presented at the Entertainment Computing: Technologies and Applications, IFIP First International Workshop on Entertainment Computing, IWEC 2002, Makuhari, JP.
- Juul, J. (2009). *A Casual Revolution: Reinventing Video Games and Their Players*. Cambridge: MIT Press.
- Kahneman, D. (1973). *Attention and Effort*. Englewood Cliffs, N.J.: Prentice-Hall.
- Kallinen, K., Kallenbach, J. & Ravaja, N. (2011). The Effects of Content Type and Presentation Style on User Experiences of Multimedia Content on a Tablet PC. 6764, 466-475.
- Kappen, D. L., Gregory, J., Stepchenko, D., Wehbe, R. R. & Nacke, L. E. (2013). Exploring social interaction in co-located multiplayer games. 1119.
- Kato, M. (2010). *Gran Turismo 5. Polyphony Digital Realizes Its Racing Dream*. [Website]. Verfügbar unter: [http://www.gameinformer.com/games/gran\\_turismo\\_5/b/ps3/archive/2010/11/24/polyphony-digital-realizes-its-racing-dream.aspx](http://www.gameinformer.com/games/gran_turismo_5/b/ps3/archive/2010/11/24/polyphony-digital-realizes-its-racing-dream.aspx) [17. 02. 2014].
- Katz, E. & Foulkes, D. (1962). On the Use of the Mass Media as "Escape": Clarification of a Concept. *Public Opinion Quarterly*, 26(3), 377.
- Kennedy, R. S., Lane, N. E., Berbaum, K. S. & Lilienthal, M. G. (1993). Simulator Sickness Questionnaire: An Enhanced Method for Quantifying Simulator Sickness. *The International Journal of Aviation Psychology*, 3(3), 203-220.
- Kilteni, K., Normand, J. M., Sanchez-Vives, M. V. & Slater, M. (2012). Extending body space in immersive virtual reality: a very long arm illusion. *PLoS One*, 7(7), e40867.
- Kim, T. & Biocca, F. (1997). Telepresence via television: Two dimensions of telepresence may have different connections to memory and persuasion. *Journal of Computer-Mediated Communication*, 3(2).
- King, R. D. (2013). A brief history of stereoscopy. *Wiley Interdisciplinary Reviews: Computational Statistics*, 5(4), 334-340.
- Kirakowski, J. & Corbett, M. (1993). SUMI: The Software Usability Measurement Inventory. *British Journal of Educational Technology*, 24, 210-212.
- Klatzky, R. L. (1998). Allocentric and Egocentric Spatial Representations: Definitions, Distinctions, and Interconnections. *1404*, 1-17.
- Klemmert, H. (2004). *Äquivalenz- und Effektttests in der psychologischen Forschung*. Frankfurt/Main: Lang.
- Klimmt, C. (2008). Escapism. In W. Donsbach (Hrsg.), *International Encyclopedia of Communication*: Blackwell Publishing.
- Klimmt, C. & Hartmann, T. (2006). Effectance, self-efficacy, and the motivation to play video games. In P. Vorderer & J. Bryant (Hrsg.), *Playing video games: Motives, responses, and consequences* (S. 132-145). Mahwah, NJ: Lawrence Erlbaum.

- Klimmt, C. & Vorderer, P. (2003). Media Psychology “is not yet there”: Introducing Theories on Media Entertainment to the Presence Debate. *Presence: Teleoperators and Virtual Environments*, 12(4), 346-359.
- Komulainen, J., Takatalo, J., Lehtonen, M. & Nyman, G. (2008). Psychologically structured approach to user experience in games. 487.
- Korhonen, H., Montola, M. & Arrasvuori, J. (2009, 13-16. Oktober 2009). *Understanding Playful User Experience through Digital Games*. Paper presented at the International Conference on Designing Pleasurable Products and Interfaces, DPPI 09, Compiegne, FR.
- Koslow, R. E. (1987). Sex-related differences and visual-spatial mental imagery as factors affecting symbolic motor skill acquisition. *Sex Roles*, 17(9-10), 521-527.
- Kosslyn, S. M., Ball, T. M. & Reiser, B. J. (1978). Visual images preserve metric spatial information: Evidence from studies of image scanning. *Journal of Experimental Psychology: Human Perception and Performance*, 4, 47-60.
- Kosslyn, S. M., Thompson, W. L. & Ganis, G. (2006). *The Case for Mental Imagery*. Oxford: Oxford University Press.
- Krahn, B. (2012). *User Experience: Konstruktdefinition und Entwicklung eines Erhebungsinstruments*. [User Experience: Definition of the construct and development of measurements]. . Bonn: GUX | Gesellschaft für User Experience mbH.
- Krapp, A. (1993). The construct of interest: Characteristics of individual interests and interest-related actions from the perspective of a person-object-theory. *Studies in Educational Psychology*, 4.
- Kroeker, K. L. (2010). Looking beyond stereoscopic 3D's revival. *Communications of the ACM*, 53(8), 14.
- Krugman, H. E. (1965). The Impact of Television Advertising: Learning Without Involvement. *Public Opinion Quarterly*, 29(3), 349.
- Kubovy, M. (1986). *The psychology of linear perspective and renaissance art*. Cambridge: Cambridge University Press.
- Kulshreshth, A., Schild, J. & LaViola, J. J. (2012). *Evaluating user performance in 3D stereo and motion enabled video games*. Paper presented at the FDG '12 Proceedings of the Foundations of Digital Games New York, NY.
- Laarni, J., Ravaja, N., Saari, T. & Hartmann, T. (2004). *Personality-related differences in subjective presence*. Paper presented at the Seventh Annual International Workshop Presence 2004, Valencia, SP.
- Lambooi, M., Ijsselstein, W., Fortuin, M. & Heynderickx, I. (2009). Visual Discomfort and Visual Fatigue of Stereoscopic Displays: A Review. *Journal of Imaging Science and Technology*, 53(3).
- Lampton, D. R., Knerr, B. W., Goldberg, S. L., Bliss, J. P., Moshell, J. M. & Blau, B. S. (1994). The virtual environment performance assessment battery (VEPAB). *Presence: Teleoperators & Virtual Environments*, 3(2), 145-157.
- Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, 50(1), 46-70.
- Lang, P. J. (1979). A Bio-Informational Theory of Emotional Imagery. *Psychophysiology*, 16(6), 495-512.

- Lang, P. J. (1980). Behavioral treatment and bio-behavioral assessment: Computer applications. In J. B. Sidowski, J. H. Johnson & T. A. Williams (Hrsg.), *Technology in mental health care delivery systems* (S. 119-167). Norwood, NY: Ablex.
- Lapointe, J. F., Savard, P. & Vinson, N. G. (2011). A comparative study of four input devices for desktop virtual walkthroughs. *Computers in Human Behavior*, 27(6), 2186-2191.
- Laugwitz, B., Held, T. & Schrepp, M. (2008). *Construction and evaluation of a user experience questionnaire*. Paper presented at the USAB 2008, LNCS 5298.
- LaViola, J. J. & Litwiller, T. (2011). *Evaluating the benefits of 3d stereo in modern video games*. Paper presented at the CHI '11 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems New York, NY.
- Law, E. L., Hvannberg, E. & Cockton, G. (Hrsg.). (2008). *Maturing Usability*. London: Springer.
- Lee, K. M. (2004). Presence, Explicated. *Communication Theory*, 14(1), 27-50.
- Lee, S. & Kim, G. J. (2008). Effects of haptic feedback, stereoscopy, and image resolution on performance and presence in remote navigation. *International Journal of Human-Computer Studies*, 66(10), 701-717.
- Lessiter, J., Freeman, J., Keogh, E. & Davidoff, J. (2001). A Cross-Media Presence Questionnaire: The ITC-Sense of Presence Inventory. *Presence: Teleoperators and Virtual Environments*, 10(3), 282-297.
- Levine, T. R., Weber, R., Park, H. S. & Hullett, C. R. (2008). communication researchers' guide to null hypothesis significance testing and alternatives. *Human Communication Research*, 34(188-209).
- Lewis, D. (1978). Truth in fiction. *American Philosophical Quarterly*, 15(1), 37-46.
- Lewis, J. R. (1995). IBM computer usability satisfaction questionnaires: Psychometric evaluation and instructions for use. *International Journal of Human-Computer Interaction*, 7(1), 57-78.
- Lewis, K. J., Borst, G. & Kosslyn, S. M. (2011). Integrating visual mental images and visual percepts: new evidence for depictive representations. *Psychol Res*, 75(4), 259-271.
- Liebes, T. & Katz, E. (1986). Patterns of involvement in television fiction: A comparative analysis. *European Journal of Communication*, 1(2), 151-171.
- Lilli, W. & Frey, D. (1993). Die Hypothesentheorie der sozialenWahrnehmung. In D. Frey & M. Irle (Hrsg.), *Theorien der Sozialpsychologie* (Bd. Band I: Kognitive Theorien, S. 49-78). Bern, SW: Huber.
- Lim, Y.-k. & Rogers, Y. (2008). A Framework and an Environment for Collaborative Analysis of User Experience. *International Journal of Human-Computer Interaction*, 24(6), 529-555.
- Limperos, A. M., Schmierbach, M. G., Kegerise, A. D. & Dardis, F. E. (2011). Gaming across different consoles: exploring the influence of control scheme on game-player enjoyment. *Cyberpsychol Behav Soc Netw*, 14(6), 345-350.
- Lindley, S. E., Le Couteur, J. & Berthouze, N. L. (2008). *Stirring up experience through movement in game play*. Paper presented at the SIGCHI Conference on Human Factors in Computing Systems, CHI '08, New York, NY.



- Ling, Y., Brinkman, W.-P., Nefs, H. T., Qu, C. & Heynderickx, I. (2012). Effects of Stereoscopic Viewing on Presence, Anxiety, and Cybersickness in a Virtual Reality Environment for Public Speaking. *Presence: Teleoperators and Virtual Environments*, 21(3), 254-267.
- Lombard, M. & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication*, 3(2).
- Lombard, M., Ditton, T. & Weinstein, L. (2009). Measuring (Tele)Presence: The Temple Presence Inventory. *Twelfth International Workshop on Presence*. Los Angeles, CA.
- Lombard, M. & Jones, M. T. (2007). Identifying the (tele)presence literacy. *PsychNology*, 5(2), 197–206.
- Lombard, M., Weinstein, L. & Ditton, T. (2011). Measuring Telepresence: The Validity of the Temple Presence Inventory (TPI) in a Gaming Context. *International Society for Presence Research Annual Conference, ISPR 2011* (S. 1-10). Edinburgh, SC: Edinburgh Napier University.
- Luk'yanyitsa, A. A. (2012). Image synthesis for autostereoscopic systems. *Computational Mathematics and Modeling*, 23(2), 195-207.
- MacKenzie, I. S. & Zhang, S. X. (1999). *The design and evaluation of a high-performance soft keyboard*. Paper presented at the ACM Conference on Human Factors in Computing Systems - CHI'99, New York, NY.
- Mahoney, N., Oikonomou, A. & Wilson, D. (2011, 27-30 July 2011). *Stereoscopic 3D in video games: A review of current design practices and challenges*. Paper presented at the 16th International Conference on Computer Games (CGAMES), Louisville, KY.
- Mair, G. M. (2013). *How Fiction Informed the Development of Telepresence and Teleoperation*. Paper presented at the 5th International Conference, VAMR 2013, Held as Part of HCI International 2013, Las Vegas, NV, USA, July 21-26, 2013, Proceedings, Part I.
- Mammarella, I. C., Pazzaglia, F. & Cornoldi, C. (2008). Evidence for different components in children's visuospatial working memory. *British Journal of Developmental Psychology*, 26(3), 337-355.
- Marshall, K. (2013, 23.03.2014). *3D TV is dead. Are 3D movies next?* Verfügbar unter: <http://www.spike.com/articles/nzmuiy/all-access-weekly-3d-tv-is-dead-are-3d-movies-next>
- Martinez, M. E. (1999). Cognitive Representations: Distinctions, Implications, and Elaborations. In I. E. Sigel (Hrsg.), *Development of Mental Representation: Theories and Applications* (S. 3-12). Mahwah, NJ: Lawrence Erlbaum.
- Masters, T. (2010). James Cameron: 3D conversion best for classic films, *BBC News*. London: BBC.
- Mazlan, M. N. A. & Bakar, M. A. A. (2013). Students' Perception of Self-presentation towards Avatar. *Procedia - Social and Behavioral Sciences*, 97, 361-367.
- McAuley, E., Duncan, T. & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: a confirmatory factor analysis. *Res Q Exerc Sport*, 60(1), 48-58.



- McGloin, R. & Krcmar, M. (2011). The Impact of Controller Naturalness on Spatial Presence, Gamer Enjoyment, and Perceived Realism in a Tennis Simulation Video Game. *Presence: Teleoperators and Virtual Environments*, 20(4), 309-324.
- McMahan, R. P., Alon, A. J. D., Lazem, S., Beaton, R. J., Machaj, D., Schaefer, M. et al. (2010). Evaluating natural interaction techniques in video games. 11-14.
- McMahan, R. P., Gorton, D., Gresock, J., McConnell, W. & Bowman, D. A. (2006). Separating the effects of level of immersion and 3D interaction techniques. 108.
- McNamara, T. P. (1986). Mental representations of spatial relations. *Cognitive Psychology*, 18, 87-121.
- McWhorter, S., Hodges, L. F. & Rodriguez, W. (1991). *Evaluation of display parameters affecting user performance of an interactive task in a virtual environment*. Atlanta: Georgia Institute of Technology.
- Metzinger, T. (2006). Reply to Gallagher: different conceptions of embodiment. *Psyche*, 12(4).
- Michel, B. (2014). Rembrandt 3D Demonstrates Top-Class Glasses-Free 3D Using 4K LCD Panel *Stereoscopy News*. Sprimont, BE.
- Milgram, P., Takemura, H., Utsumi, A. & Kishino, F. (1994). Augmented reality: a class of displays on the reality-virtuality continuum. 2351, 282-292.
- Minsky, M. (1980). Telepresence. *Omni*, June, 45-51.
- Miyamoto, S. (1985). Super Mario Bros. (Version Famicom, Nintendo Entertainment System) [Video Game]. Kyoto, JP: Nintendo.
- Moby Games*. (2014). [Website]. Verfügbar unter: <http://www.mobygames.com/search/quick?q=Tennis> [21.02. 2014].
- Mon-Williams, M. & Wann, J. P. (1998). Binocular Virtual Reality Displays: When Problems Do and Don't Occur. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 40(1), 42-49.
- Moosbrugger, H. & Hartig, J. (2002). Factor analysis in personality research: Some artefacts and their consequences for psychological assessment. *Psychologische Beiträge*, 44, 136-158.
- Morran, C. (2014). 3D TV is dead. Will glasses-free 3D resurrect it?, *Consumerist*. Yonkers, NY: Consumer Media LLC.
- Morrow, D. G., Greenspan, S. L. & Gordon, H. B. (1987). Accessibility and Situation Models in Narrative Comprehension. *Journal of Memory and Language*, 26, 165-187.
- Müller, H. J. & Rabbitt, P. M. A. (1989). Reflexive and voluntary orienting of visual attention: Time course of activation and resistance to interruption. *Journal of Experimental Psychology: Human Perception and Performance*, 15, 315-330.
- Muncy, J. A. & Hunt, S. D. (1984). Consumer involvement: Definitional issues and research directions. In T. C. Kinnear (Hrsg.), *NA - advances in consumer research* (Bd. 11, S. 193-196). Provo, UT: Association for Consumer Research.
- Murphy, K. R., Myers, B. & Wolach, A. (2009). *Statistical power analysis: A simple and general model for traditional and modern hypothesis tests* (3rd). New York, NY: Routledge.
- Murray, J. (1997). *Hamlet on the holodeck: The future of narrative in cyberspace*. Cambridge, MA: MIT Press.

- Nabi, H., Rachid Salmi, L., Lafont, S., Chiron, M., Zins, M. & Lagarde, E. (2007). Attitudes associated with behavioral predictors of serious road traffic crashes: results from the GAZEL cohort. *Inj Prev*, 13(1), 26-31.
- Nacke, L. E., Drachen, A., Kuikkaniemi, K., Niesenhaus, J., Korhonen, H. J., van den Hoogen, W. M. et al. (2009). *Playability and Player Experience Research*. Paper presented at the Breaking New Ground: Innovation in Games, Play, Practice and Theory. Proceedings of DiGRA 2009, London, UK.
- Nacke, L. E., Niesenhaus, J., S., E., Canossa, A., Kuikkaniemi, K. & Immich, T. (2010). *Bringing Digital Games to User Research and User Experience*. Paper presented at the Interaktive Kulturen 2010.
- Namco. (1997). Time Crisis II (Version PlayStation 2) [Video Game]. Tokyo, JP: Namco.
- Namco. (2003). Donkey Konga (Version GameCube) [Video Game]. Redmond, WA: Nintendo of America.
- Naughty Dog. (2011). Uncharted 3: Drake's Deception. [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Nintendo. (2006). Wii Sports [Video game]. Redmont, WA: Nintendo of America.
- Nintendo. (2008). Mario Kart Wii (Version Wii) [Video Game]. Redmond, WA: Nintendo of America.
- Noessel, C. (2013). What Sci-Fi Tells Interaction Designers About Gestural Interfaces, *Smashing Magazine*. Freiburg, DE: Smashing Media.
- Nordstokke, D. W. & Zumbo, B. D. (2010). A new nonparametric Levene test for equal variances. *Psicológica*, 31(2), 401-430.
- Norman, D. (1998). *The invisible computer: Why good products can fail, the personal computer is so complex, and information appliances are the answer*. Boston, MA: MIT Press.
- Norman, D. (2013). *The Design of Everyday Things - Revised and expanded edition* (3rd). New York, NY: Basic Books.
- Novint. (2012). *Novint Falcon*. [Website]. Verfügbar unter: <http://home.novint.com/index.php/products/novintfalcon> [06. 04. 2014].
- Nowak, K. L. & Biocca, F. (2003). The Effect of the Agency and Anthropomorphism on Users' Sense of Telepresence, Copresence, and Social Presence in Virtual Environments. *Presence: Teleoperators and Virtual Environments*, 12(5), 481-494.
- Nunez, D. (2007). A capacity limited, cognitive constructionist model of virtual presence (Bd. 2013). University of Cape Town South Africa.
- Ohler, P. (1994). *Kognitive Filmpsychologie. Verarbeitung und mentale Repräsentation [Cognitive psychology of movies. Processing and mental representation of narrative movies]*. Münster: MAkS-Publikationen.
- Ohler, P. & Nieding, G. (1996). Cognitive modeling of suspense-inducing structures in narrative films. In P. Vorderer, H. J. Wulff & M. Friedrichsen (Hrsg.), *Suspense conceptualizations, theoretical analyses and empirical explorations* (S. 129-147). Hillsdale, NJ: Lawrence Erlbaum.
- Oliver, M. B. (1993). Exploring the Paradox of the Enjoyment of Sad Films. *Human Communication Research*, 19(3), 315-342.
- Olsen, R. (2008). In P. J. Lavrakas (Hrsg.), *Encyclopedia of Survey Research Methods*.

- Paivio, A. (1971). *Imagery and Verbal Processes*. New York, NY: Holt, Rinehart and Winston.
- Patel, H., Stefani, O., Sharples, S., Hoffmann, H., Karaseitanidis, I. & Amditis, A. (2006). Human centred design of 3-D interaction devices to control virtual environments. *International Journal of Human-Computer Studies*, 64(3), 207-220.
- Peltonen, J., Ma, W. & Kozlowski, T. (2014). Effective spatial mapping for coupled code analysis of thermal-hydraulics/neutron-kinetics of boiling water reactors. *Annals of Nuclear Energy*, 63, 461-485.
- Perner, J. (1993). *Understanding the representational mind*. Cambridge, MA: MIT Press.
- Petrie, H. & Bevan, N. (2009). The evaluation of accessibility, usability and user experience. In C. Stephanidis (Hrsg.), *The Universal Access Handbook*. Boca Raton, FL: CRC Press.
- Petty, R. E. & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Hrsg.), *Advances in experimental social psychology* (S. 123–205). New York, NY: Academic Press.
- Petty, R. E., Cacioppo, J. T. & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10(2), 135.
- Piaget, J. & Inhelder, B. (1956). *The child's conception of space*. London, UK: Routledge & Kegan Paul.
- Pietschmann, D. (2009). *Experiencing virtual environments. Involvement, immersion and engagement in computer games [Das Erleben virtueller Welten. Involvement, Immersion und Engagement in Computerspielen]*. Glückstadt: vwh.
- Pietschmann, D. (2013). Spatial Mapping of Input and Output Spaces in Video Games. In F. Schröter (Hrsg.), *Games, Cognition, and Emotion*. Hamburg University: Hamburg University.
- Pietschmann, D., Liebold, B. & Ohler, P. (2013, 31.01.-01.02.2013). *Spatial Mapping of Mental Interaction Models and Stereoscopic Presentation*. Paper presented at the 2nd Conference on Research and Use of VR/AR Technologies, VAR2, Chemnitz.
- Pietschmann, D., Liebold, B., Valtin, G., Nebel, S. & Ohler, P. (2013, 04.-06.09.2013). *Effects of Video Game GUIs on the Construction of Rich Spatial Situation Models and Spatial Presence*. Paper presented at the 8th Conference of the Media Psychology Division of the German Psychological Society, Würzburg.
- Pietschmann, D., Liebold, B., Valtin, G. & Ohler, P. (2013). Taking space literally: Reconceptualizing the effects of stereoscopic representation on User Experience. *Italian Journal of Game Studies*, 2(1), Retrieved from <http://www.gamejournal.it/taking-space-literally-reconceptualizing-the-effects-of-stereoscopic-representation-on-user-experience/#.UUmGAb8purd>.
- Pietschmann, D. & Rusdorf, S. (2014). *Matching Levels of Task Difficulty for Different Modes of Presentation in a VR Table Tennis Simulation by Using Assistance Functions and Regression Analysis*. Paper presented at the HCI International 2014, Heraklion, GR.
- Pietschmann, D., Valtin, G. & Ohler, P. (2012). The Effect of Authentic Input Devices on Computer Game Immersion. In J. Fromme & A. Unger (Hrsg.), *Computer Games*

- and *New Media Cultures. A Handbook of Digital Games Studies* (S. 279-292). Dordrecht, Heidelberg, New York, London: Springer.
- Pimentel, K. & Teixeira, K. (1993). *Virtual reality: Through the new looking-glass*. New York, NY: McGraw-Hill.
- Pointer, J. S. (2012). The interpupillary distance in adult Caucasian subjects, with reference to 'readymade' reading spectacle centration. *Ophthalmic & physiological optics: the journal of the British College of Ophthalmic Opticians*, 32(4), 324-331.
- Polonen, M., Jarvenpaa, T. & Bilcu, B. (2013). Stereoscopic 3D entertainment and its effect on viewing comfort: comparison of children and adults. *Appl Ergon*, 44(1), 151-160.
- Polyphony Digital Inc. (2010). *Gran Turismo 5* [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Popova, L. (2011). *Perceived reality in media messages: Concept explication and testing*. Dissertation, University of California Santa Barbara, Santa Barbara, CA.
- Posner, M. I., Snyder, C. R. & Davidson, B. J. (1980). Attention and the Detection of Signals. *Journal of Experimental Psychology: General*, 109.
- Power and Magic Development. (2008). *Top Spin 3*. Novato, CA: 2K Sports.
- Proctor, M. D. & Campbell-Wynn, L. (2014). Effectiveness, usability, and acceptability of haptic-enabled virtual reality and mannequin modality simulators for surgical cricothyroidotomy. *Military Medicine*, 179(3), 260-264.
- Prothero, J., Parker, D. E., Furness, T. A. I. & Wells, M. J. (1995). Towards a robust quantitative measure for presence, *Conference on Experimental Analysis and Measurement of Situation Awareness*. Daytona Beach, FL.
- Pylyshyn, Z. W. (1973). What the Mind's Eye Tells the Mind's Brain: A Critique of Mental Imagery. 1-36.
- Pylyshyn, Z. W. (2003). *Seeing and Visualizing: It's Not What You Think*. Cambridge, MA: MIT Press.
- Rajae-Joordens, R. J. E. (2008). Measuring Experiences in Gaming and TV Applications. In J. H. D. M. Westerink, M. Ouwerkerk, T. J. M. Overbeek, W. F. Pasveer & B. Ruyter (Hrsg.), *Probing Experience. From Assessment of User Emotions and Behaviour to Development of Products* (Bd. 8, S. 77-90): Springer Netherlands.
- Rajae-Joordens, R. J. E., Langendijk, E., Wilinski, P. & Heynderickx, I. (2005). Added value of a multi-view auto-stereoscopic 3D display in gaming applications, *12th International Display Workshops in conjunction with Asia Display*. Takamatsu, Japan.
- Raney, A. A. (2002). Moral Judgment as a Predictor of Enjoyment of Crime Drama. *Media Psychology*, 4(4), 305-322.
- Rare. (2010). *Kinect Sports* [Video Game]. Redmond, WA: Microsoft Game Studios.
- Ratan, R. A. (2012). Self-Presence, explicated: Body, emotion, and identity extension into the virtual self. In R. Luppincini (Hrsg.), *Handbook on Research on Technoself*. New York, NY: IGI Global.
- Ratan, R. A. & Hasler, B. S. (2009). *Self-Presence Standardized: Introducing the Self-Presence Questionnaire (SPQ)*. Paper presented at the International Conference on Presence, ISPR 2009, Los Angeles, CA.

- Ratan, R. A. & Hasler, B. S. (2010). Exploring Self-Presence in Collaborative Virtual Teams. *PsychNology*, online.
- Ratan, R. A. & Sah, Y. J. (2014). *The Spawn of Presence: Examining the Relationship between Presence and Self-Presence*. Paper presented at the Challenging Presence. International Society for Presence Research, ISPR 2014, Vienna, AU.
- Reeves, B., Lang, A., Kim, E. Y. & Tatar, D. (1999). The Effects of Screen Size and Message Content on Attention and Arousal. *Media Psychology*, 1(1), 49-67.
- Reich, D. (2013, 10.-12.10.2013). *Der Einfluss von Immersivität in virtuellen Umgebungen auf Situation Awareness im Fahrzeug*. Paper presented at the Grundlagen und Anwendung der Mensch-Maschine-Interaktion: 10. Berliner Werkstatt Mensch-Maschine-Systeme, Berlin.
- Remo, C. (2010). On Changing the Shape of Interaction, *Gamasutra. The Art & Business of Making Games* (S. 1-6).
- Richard, P. & Coiffet, P. (1995). *Human perceptual issues in virtual environments: Sensory substitution and information redundancy*. Paper presented at the 4th IEEE International Workshop on Robot and Human Communication, RO-MAN'95, Tokyo.
- Riecke, B. E. & Von der Heyde, M. (2002). *Qualitative Modeling of Spatial Orientation Processes using logical Propositions: Interconnecting Spatial Presence, Spatial Updating, and Spatial Cognition* (Technical Report No. 100): Max Planck Institute for Biological Cybernetics.
- Riecke, B. E., von der Heyde, M. & Bühlhoff, H. H. (2001). *How do we know where we are? Contribution and interaction of visual and vestibular cues for spatial updating in real and virtual environments*. Paper presented at the TKW 2001. Beiträge zur 4. Tübinger Wahrnehmungskonferenz, Tübingen.
- Rinck, M., Hähnel, A., Bower, G. H. & Glowalla, U. (1997). The metrics of spatial situation models. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 23(3), 622-637.
- Rinck, M., Williams, P., Bower, G. H. & Becker, E. S. (1996). Spatial situation models and narrative understanding: Some generalizations and extensions. *Discourse Processes*, 21(1), 23-55.
- Rivett, J. & Holliman, N. S. (2013). *Stereoscopic game design and evaluation*. Paper presented at the Stereoscopic Displays and Applications XXIV, Burlingame.
- Robinson, M. (2010). *Gran Turismo 5 Review. Driven to perfection?* Verfügbar unter: <http://www.ign.com/articles/2010/11/24/gran-turismo-5-review> [17. 02. 2014].
- Rooney, B. & Hennessy, E. (2013). Actually in the Cinema: A Field Study Comparing Real 3D and 2D Movie Patrons' Attention, Emotion, and Film Satisfaction. *Media Psychology*, 16(4), 441-460.
- Rosenkrantz, C. & Oh, S. Y. (2014). *Measuring Presence: The Use of Five Canonical Presence Questionnaires from 1998-2012*. Paper presented at the Challenging Presence. International Society for Presence Research, ISPR 2014, Vienna, AU.
- Roth, C., Vorderer, P. & Klimmt, C. (2009). The Motivational Appeal of Interactive Storytelling: Towards a Dimensional Model of the User Experience. 5915, 38-43.
- Roth, C., Vorderer, P., Klimmt, C. & Vermeulen, I. E. (2011). The User Experience of Interactive Digital Storytelling: Theory and Measurement. 7069, 362-363.

- Rothschild, M. L. (1984). Perspectives on involvement: Current problems and future directions. In T. C. Kinnear (Hrsg.), *NA - advances in consumer research* (Bd. 11, S. 216–217). Provo, UT: Association for Consumer Research.
- Roto, V., Lee, M., Pihkala, K., Castro, B., Vermeeren, A. P. O. S., Law, E. L. et al. (2013). *All About UX. Information for User Experience Professionals*. [Website]. Verfügbar unter: <http://www.allaboutux.org/all-methods> [03.03. 2014].
- Ruscio, J. & Roche, B. (2012). Determining the number of factors to retain in an exploratory factor analysis using comparison data of known factorial structure. *Psychol Assess*, 24(2), 282-292.
- Rusdorf, S. & Brunnett, G. (2005). *Real Time Tracking of High Movements in the Context of a Table Tennis Application*. Paper presented at the ACM symposium on Virtual reality software and technology 2005, New York, NY.
- Rusdorf, S., Brunnett, G., Lorenz, M. & Winkler, T. (2007). Real Time Interaction with a Humanoid Avatar in an Immersive Table Tennis Simulation. *IEEE Transactions on Visualization and Computer Graphics*, 13(1), 15-25.
- Ryan, M.-L. (1991). *Possible worlds, artificial intelligence, and narrative theory*. Bloomington: Indiana University Press.
- Ryan, M.-L. (1994). Immersion vs. interactivity: Virtual reality and literary theory. *Postmodern Culture*, 5(1).
- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43(3), 450-461.
- Sacau, A., Laarni, J. & Hartmann, T. (2008). Influence of individual factors on presence. *Computers in Human Behavior*, 24(5), 2255-2273.
- Sacau, A., Laarni, J., Ravaja, N. & Hartmann, T. (2005). The impact of personality factors on the experience of spatial presence, *8th International Workshop on Presence, PRESENCE 2005*. London, UK.
- Sánchez, J. L. G., Vela, F. L. G., Simarro, F. M. & Padilla-Zea, N. (2012). Playability: analysing user experience in video games. *Behaviour & Information Technology*, 31(10), 1033-1054.
- Satava, R. M. (2008). Historical review of surgical simulation--a personal perspective. *World Journal of Surgery*, 32(2), 141-148.
- Sauro, J. & Dumas, J. S. (2009). Comparison of three one-question, post-task usability questionnaires. 1599.
- Schank, R. C. & Abelson, R. (1977). *Scripts, plans, goals and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Lawrence Erlbaum.
- Schild, J., LaViola, J. J. & Masuch, M. (2012). *Understanding user experience in stereoscopic 3D games*. Paper presented at the CHI '12 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, New York, NY.
- Schild, J., LaViola, J. J. & Masuch, M. (2014). *Altering Gameplay Behavior using Stereoscopic 3D Vision-Based Video Game Design*. Paper presented at the SIGCHI Conference on Human Factors in Computing Systems ACM CHI'2014, Toronto, CA.
- Schild, J. & Masuch, M. (2011). Fundamentals of Stereoscopic 3D Game Design. 6972, 155-160.



- Schild, J., Seele, S. & Masuch, M. (2011). Integrating Stereoscopic Video in 3D Games. *6972*, 124-135.
- Schild, J., Seele, S. & Masuch, M. (2012). *YouDash3D - Exploring Depth-based Game Mechanics and Stereoscopic Video in S3D Gaming*. Paper presented at the Int. Conference on Advances in Computer Entertainment Technology (ACE'2011), Lissabon.
- Schmierbach, M., Limperos, A. M. & Woolley, J. K. (2012). Feeling the need for (personalized) speed: how natural controls and customization contribute to enjoyment of a racing game through enhanced immersion. *Cyberpsychology, Behavior, and Social Networking*, *15*(7), 364-369.
- Schmitt, P. J., Agarwal, N. & Prestigiacomio, C. J. (2012). From planes to brains: parallels between military development of virtual reality environments and virtual neurological surgery. *World Neurosurgery*, *78*(3-4), 214-219.
- Schmitz, M., Endres, C. & Butz, A. (2007). *A Survey of Human-Computer Interaction Design in Science Fiction Movies*. Paper presented at the INTETAIN '08 Proceedings of the 2nd international conference on INtelligent TEchnologies for interactive enterTAINment Brüssel, BE.
- Schnortz, W. (1988). Textverstehen als Aufbau mentaler Modelle. In H. Mandl & H. Spada (Hrsg.), *Wissenspsychologie* (S. 299-330). München: Psychologie-Verlags-Union.
- Schramm, H. & Wirth, W. (2010). Exploring the paradox of sad-film enjoyment: The role of multiple appraisals and meta-appraisals. *Poetics*, *38*(3), 319-335.
- Schrepp, M., Held, T. & Laugwitz, B. (2006). The influence of hedonic quality on the attractiveness of user interfaces of business management software. *Interacting with Computers*, *18*(5), 1055-1069.
- Schubert, T., Friedmann, F. & Regenbrecht, H. (2001). The Experience of Presence: Factor Analytic Insights. *Presence: Teleoperators and Virtual Environments*, *10*(3), 266-281.
- Schumacher, R. (2010). *The Handbook of Global User Research*. Boston, NY: Morgan Kaufmann.
- Sega AM3 R&D. (2011). Virtual Tennis 4 [Video Game]. Brentford, UK: SEGA Europe.
- Sensable. (2014, 2014). *Phantom Omni Haptic Device*. [Website]. Verfügbar unter: <http://www.dentsable.com/haptic-phantom-omni.htm> [10.04.2014 2014].
- Shafer, D. M., Carbonara, C. P. & Popova, L. (2011). Spatial Presence and Perceived Reality as Predictors of Motion-Based Video Game Enjoyment. *Presence: Teleoperators and Virtual Environments*, *20*(6), 591-619.
- Shapiro, L. (2011). *Embodied Cognition*. New York, NY: Routledge.
- Shedroff, N. & Noessel, C. (2012). *Make it So: Interface Design Lessons from Sci-Fi*. Brooklyn, NY: Rosenfeld Media.
- Sheridan, T. B. (1992). Musings on telepresence and virtual presence. *Presence: Teleoperators & Virtual Environments*, *1*(1), 120-126.
- Sherif, C. W., Kelly, M., Rodgers Jr., H. L., Sarup, G. & Tittler, B. (1973). Personal involvement, social judgment, and action. *Journal of Personality and Social Psychology*, *27*(3), 311-328.
- Sherif, M. & Cantril, H. (1947). *The psychology of ego involvement*. New York, NY: John Wiley.



- Sherif, M. & Hovland, C. (1961). *Social judgment*. New Haven: Yale University Press.
- Shinar, D. & Acton, M. B. (1978). Control display relationships on the four-burner range: population stereotypes versus standards. *Human Factors*, 20, 13-17.
- Simpson, R. M., LaViola, J. J., Laidlaw, D. H., Forsberg, A. S. & van Dam, A. (2000). Immersive VR for scientific visualization: a progress report. *IEEE Computer Graphics and Applications*, 20(6), 26-52.
- Skalski, P., Lange, R. L., Tamborini, R. & Shelton, A. K. (2007). Mapping the Road to Fun: Natural Video Game Controllers, Presence, and Game Enjoyment. *ICA Annual Conference*. San Francisco, CA, USA.
- Skalski, P., Tamborini, R., Shelton, A., Buncher, M. & Lindmark, P. (2010). Mapping the road to fun: Natural video game controllers, presence, and game enjoyment. *New Media & Society*, 13(2), 224-242.
- Skalski, P., Tamborini, R., Shelton, A., Buncher, M. & Lindmark, P. (2011). Mapping the road to fun: Natural video game controllers, presence, and game enjoyment. *New Media & Society*, 13(2), 224-242.
- Slater, M. (1999). Measuring Presence: A Response to the Witmer and Singer Presence Questionnaire. *Presence: Teleoperators and Virtual Environments*, 8(5), 560-565.
- Slater, M. (2002). Presence and the sixth sense. *Presence: Teleoperators and Virtual Environments*, 11(4), 435-439.
- Slater, M. (2003). A note on presence terminology. *Presence Connect 3*: 3
- Slater, M. (2004). How colorful was your day? Why questionnaires cannot assess presence in virtual environments. *Presence: Teleoperators & Virtual Environments*, 13(4), 484-493.
- Slater, M. (2009). Place illusion and plausibility can lead to realistic behaviour in immersive virtual environments. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1535), 3549-3557.
- Slater, M., Linakis, V., Usuh, M., Kooper, R. & Street, G. (1996). *Immersion, Presence, and Performance in Virtual Environments: An Experiment with Tri-Dimensional Chess*. Paper presented at the ACM Virtual Reality Software and Technology. Proceedings of VRST 96, Hong Kong.
- Slater, M., Perez-Marcos, D., Ehrsson, H. H. & Sanchez-Vives, M. V. (2008). Towards a digital body: the virtual arm illusion. *Front Hum Neurosci*, 2, 6.
- Slater, M., Spanlang, B. & Corominas, D. (2010). Simulating virtual environments within virtual environments as the basis for a psychophysics of presence. *ACM Transactions on Graphics*, 29(4), 1.
- Slater, M. & Steed, A. (2000). A Virtual Presence Counter. *Presence: Teleoperators and Virtual Environments*, 9(5), 413-434.
- Slater, M. & Usuh, M. (1994). Body Centered Interaction in Immersive Virtual Environments. In M. Thalmann & D. Thalmann (Hrsg.), *Artificial Life and Virtual Reality* (S. 125-148). Oxford, UK: John Wiley.
- Slater, M., Usuh, M. & Steed, A. (1994). Depth of presence in immersive virtual environments. *Presence: Teleoperators & Virtual Environments*, 3(2), 130-144.
- Slater, M., Usuh, M. & Steed, A. (1995). Taking steps: the influence of a walking technique on presence in virtual reality. *ACM Transactions on Computer-Human Interaction (TOCHI) - Special issue on virtual reality software and technology*, 2(3), 201-219.

- Slater, M. & Wilbur, S. (1997). A framework for immersive virtual environments (FIVE): Speculations on the role of presence in virtual environments. *Presence: Teleoperators & Virtual Environments*, 6(6), 603–617.
- Slightly Mad Studios. (2009). Need for Speed: SHIFT [Video Game]. Redwood City, CA: Electronic Arts.
- Sliwinski, A. (2010). *Gran Turismo 5 wins 'best of Gamescom awards 2010*. [Website]. Verfügbar unter: <http://www.joystiq.com/2010/08/23/gran-turismo-5-wins-best-of-gamescom-awards-2010/> [17. 02. 2014].
- Sobieraj, S., Krämer, N. C., Engler, M. & Siebert, M. (2011). The influence of 3D screenings on presence and perceived entertainment, *International Society for Presence Research Annual Conference (ISPR 2011)*. Edinburgh, Scotland.
- Soetens, E., Deboeck, M. & Hueting, J. (1984). Traces of fatigue in an attention dual task: II. *Bulletin of the Psychonomic Society*, 22(6), 514-516.
- Spagnoli, A. (2014). *Presence in Action: An Updated Overview of an Action-based Approach to Presence*. Paper presented at the Challenging Presence. International Society for Presence Research, ISPR 2014, Vienna, AU.
- Spence, C. & Driver, J. (1994). Covert spatial orienting in audition: Exogenous and endogenous mechanisms facilitate sound localization. *Journal of Experimental Psychology: Human Perception and Performance*, 20, 555-574.
- Spielberg, S. (Writer) (2002). Minority Report [BR]. USA: Twentieth Century Fox Film Corporation.
- Steinicke, F. & Bruder, G. (2013). Using Perceptual Illusions for Redirected Walking. *IEEE Computer Graphics and Applications IEEE Computer Graphics and Applications* 33(1), 6-11.
- Steinicke, F., Bruder, G., Jerald, J., Frenz, H. & Lappe, M. (2010). Estimation of detection thresholds for redirected walking techniques. *IEEE Transactions on Visual and Computer Graphics*, 16(1), 17-27.
- Steinicke, F., Visell, Y., Campos, J. & Lécuyer, A. (Hrsg.). (2013). *Human Walking in Virtual Environments*. New York, NY: Springer.
- Steuer, J. (1992). Defining Virtual Reality: Dimensions Determining Telepresence. *Journal of Communication*, 42(4), 73-93.
- Streiner, D. L. (1998). Factors affecting reliability of interpretations of scree plots. *Psychological Reports*, 83, 687-694.
- Sucker Punch Productions. (2010). Sly 2: Band of Thieves [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Sumo Digital. (2008). SEGA Superstars Tennis [Video Game]. San Francisco, CA: SEGA of America.,
- Supermassive Games. (2010). Tumble [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Surdick, T., Davis, E. T., King, R. A. & Hodges, L. F. (1997). The perception of distance in simulated visual displays: A comparison of the effectiveness and accuracy of multiple depth cues across viewing distances. *Presence: Teleoperators & Virtual Environments*, 6(5), 513-531.

- Takatalo, J., Häkkinen, J., Kaistinen, J. & Nyman, G. (2010). User Experience in Digital Games. Differences Between Laboratory and Home. *Simulation & Gaming*, 42(5), 656-673.
- Takatalo, J., Kawai, T., Kaistinen, J., Nyman, G. & Hakkinen, J. (2011). User Experience in 3D Stereoscopic Games. *Media Psychology*, 14(4).
- Tamborini, R., Bowman, N. D., Eden, A., Grizzard, M. & Organ, A. (2010). Defining Media Enjoyment as the Satisfaction of Intrinsic Needs. *Journal of Communication*, 60(4), 758-777.
- Tamborini, R. & Skalski, P. (2006). The role of presence in the experience of electronic games. In P. Vorderer & J. Bryant (Hrsg.), *Playing video games. Motives, responses and consequences*. (S. 225–240). Mahwah, NJ: Lawrence Erlbaum.
- Tauer, H. (2010). *Stereo-3D. Grundlagen, Technik und Bildgestaltung*: Schiele & Schoen.
- Taylor, H. A. & Rapp, D. N. (2006). Updating Human Spatial Memory. In M. F. Brown & R. G. Cook (Hrsg.), *Animal Spatial Cognition: Comparative, Neural & Computational Approaches*.
- Taylor, S. C., Firth, S. K., Wang, C., Allinson, D., Quddus, M. & Smith, P. (2014). Spatial mapping of building energy demand in Great Britain. *GCB Bioenergy*, 6(2), 123-135.
- Teather, R. J. & Stuerzlinger, W. (2007). *Guidelines for 3D positioning techniques*. Paper presented at the Future Play '07 Proceedings of the 2007 conference on Future Play New York, NY.
- Tedesco, D. P. & Tulis, T. S. (2006). A comparison of methods for eliciting post-task subjective ratings in usability testing, *Usability Professionals Association Annual Conference*. Broomfield, CO.
- Tellegen, A. & Atkinson, G. (1974). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, 83(3), 268–277.
- Texas Instruments. (2014). *DLP Link*. [Website]. Verfügbar unter: <http://www.dlp.com/de/projector/dlp-innovations/dlp-link.aspx> [13.04. 2014].
- Thorndyke, P. W. (1981). Distance estimation from cognitive maps. *Cognitive Psychology*, 13(4), 526-550.
- Treadgold, M., Novins, K., Wyvill, G. & Niven, B. (2001). What do you think you're doing? Measuring perception in fish tank virtual reality. 325-328.
- Trenholm, R. (2014, 23.03.2014). *8 out of 10 regret buying a 3D TV, survey says* Verfügbar unter: <http://www.cnet.com/news/8-out-of-10-regret-buying-a-3d-tv-survey-says/>
- Trinkle, M. (2014). *Minority Report: The Question of Free Will & Fate*. [Website]. Verfügbar unter: <http://www.cinemablography.org/minority-report.html> [05.04. 2014].
- Tsigilis, N. & Theodosiou, A. (2003). Temporal stability of the intrinsic motivation inventory. *Percept Mot Skills*, 97(1), 271-280.
- Tullis, T. & Albert, W. (2008). *Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics*. Burlington, MA: Morgan Kaufmann.
- Ubisoft. (2009). James Cameron's Avatar: The Game [Video Game]. Montreal, CA: Ubisoft.
- Underkoffler, J. (2010, Feb. 12). g-speak (point and touch interface demonstration), *TED 2010. What the World Needs Now*. Long Beach, CA.

- Utsugi, K., Moriya, T. & Takeda, H. (2001). Making of a Virtual World of Heijokyo from Historical Knowledge, *Proceedings of the Seventh International Conference on Virtual Systems and Multimedia (VSMM'01)* (S. 299): IEEE Computer Society.
- Valve. (2008). Left 4 Dead [Video Game]. Kirkland, WA: Valve Corporation.
- Van Dijk, T. A. & Kintsch, W. (1983). *Strategies of discourse comprehension*. New York, NY: Academic Press.
- Vandenberg, S. G., Kuse, A. R. & Vogler, G. P. (1985). Searching for correlates of spatial ability. *Perceptual and Motor Skills*, 60(2), 343-350.
- Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, 41, 321-327.
- Vermeeren, A. P. O. S., Law, E. L.-C., Roto, V., Obrist, M., Hoonhout, J. & Väänänen-Vainio-Mattila, K. (2010). User experience evaluation methods. 521.
- Villani, D., Repetto, C., Cipresso, P. & Riva, G. (2012). May I experience more presence in doing the same thing in virtual reality than in reality? An answer from a simulated job interview. *Interacting with Computers*, 24(4), 265-272.
- Visual Concepts Entertainment. (2009). Major League Baseball 2K9 [Video Game]. Novato, CA: 2K Sports.
- Von Holst, E. & Mittelstaedt, H. (1950). Das Reafferenzprinzip. *Naturwissenschaften*, 37, 464-476.
- VooFoo Studios. (2009). Hustle Kings [Video Game]. Foster City, CA: Sony Computer Entertainment America.
- Vorderer, P. (1992). *Fernsehen als Handlung. Fernsehfilmrezeption aus motivations-psychologischer Perspektive (Television as an act. The reception of television films from the perspective of motivational psychology)*. Berlin, Germany: Sigma.
- Vorderer, P., Wirth, W., Gouveia, F. R., Biocca, F., Saari, T., Jäncke, F. et al. (2004). *MEC spatial presence questionnaire (MEC-SPQ): Short documentation and instructions for application*. Report to the European Community, Project Presence: MEC (IST-2001-37661).
- Vorderer, P., Wirth, W., Saari, T., Gouveia, F. R., Biocca, F., Jäncke, F. et al. (2003). Constructing presence: Towards a two-level model of the formation of spatial presence, *Unpublished report to the European Community, Project Presence: MEC (IST-2001-37661)*. Hannover, Munich, Helsinki, Porto, Zurich.
- Voss, K. E., Spangenberg, E. R. & Grohmann, B. (2003). Measuring the Hedonic and Utilitarian Dimensions of Consumer Attitude. *Journal of Marketing Research*, 40(3), 310-320.
- Voyer, D., Voyer, S. & Bryden, M. P. (1995). Magnitude of sex differences in spatial abilities: A meta-analysis and consideration of critical variables. *Psychological Bulletin*, 117(2), 250-270.
- Ward, L. M. (1994). Supramodal and modality-specific mechanisms for stimulus-driven shifts of auditory and visual attention. *Canadian Journal of Experimental Psychology*, 48, 242-259.
- Ware, C., Arthur, K. & Booth, K. S. (1993). *Fish tank virtual reality*. Paper presented at the CHI '93 Proceedings of the INTERACT '93 and CHI '93 Conference on Human Factors in Computing Systems, New York, NY.

- Ware, C., Gobrecht, C. & Paton, M. (1998). Dynamic adjustment of stereo display parameters. *IEEE Transactions on Systems, Man, and Cybernetics - Part A: Systems and Humans*, 28(1), 56-65.
- Watson, D., Clark, L. A. & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070.
- Weber, R. & Popova, L. (2012). Testing Equivalence in Communication Research: Theory and Application. *Communication Methods and Measures*, 6(3), 190-213.
- Webster, J. & Ho, H. (1997). Audience engagement in multimedia presentations. *ACM SIGMIS Database*, 28(2), 63-77.
- Weibel, D., Wissmath, B. & Mast, F. W. (2011). Influence of mental imagery on spatial presence and enjoyment assessed in different types of media. *Cyberpsychol Behav Soc Netw*, 14(10), 607-612.
- Weiber, R. & Mühlhaus, D. (2014). *Strukturgleichungsmodellierung* (2. Edition). Berlin, Heidelberg: Springer.
- Westerman, W. (1999). *Hand Tracking, Finger Identification, and chordic Manipulation on a Multi-Touch Surface*. Dissertation, University of Delaware, Newark, DE.
- Wickens, C. D., Vidulich, M. & Sandry-Garza, D. (1984). Principles of S-C-R compatibility with spatial and verbal tasks: The role of display-control location and voice-interactive display-control interfacing. *Human Factors*, 26(5), 533-543.
- WiiMote Physics. (2010, Juli 2010). *Physics with a WiiMote*. [Website]. Verfügbar unter: <http://wiiphysics.site88.net/> [06.04.2014 2014].
- Wilcox, R. R. (2005). *Introduction to robust estimation and hypothesis testing* (2nd). Burlington, MA: Elsevier.
- Wildt, B. t. (2012). *Medialisation. Von der Medienabhängigkeit des Menschen*. Göttingen: Vandenhoeck & Ruprecht.
- Williams, D. (2007). *The Reactable*. [Website]. Verfügbar unter: <http://www.flickr.com/photos/84466661@N00/539568298/> [01.04.2014 2014].
- Wirth, W. (2006). Involvement. In P. Vorderer & J. Bryant (Hrsg.), *Psychology of entertainment* (S. 199-213). Mahwah, NJ: Lawrence Erlbaum.
- Wirth, W., Hartmann, T., Böcking, S., Vorderer, P., Klimmt, C., Schramm, H. et al. (2007). A process model of the formation of spatial presence experiences. *Media Psychology*, 9(3), 493-525.
- Wirth, W., Hofer, M. & Schramm, H. (2012). The role of emotional involvement and trait absorption in the formation of spatial presence. *Media Psychology*, 15(1), 19-43.
- Witmer, B. G., Jerome, C. J. & Singer, M. J. (2005). The Factor Structure of the Presence Questionnaire. *Presence: Teleoperators and Virtual Environments*, 14(3), 298-312.
- Witmer, B. G. & Singer, M. J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence*, 7(3), 225-240.
- Witzmann, H. (2007). *Game Controller: Vom Paddle zur gestenbasierten Steuerung*. Boizenburg: Hülsbusch.
- Wolf, K., Hasebrook, J. & Rinck, M. (1999). Wand oder keine Wand? Die Repräsentation räumlicher Veränderungen in Situationsmodellen. *Experimental Psychology (formerly "Zeitschrift für Experimentelle Psychologie")*, 46(3), 152-163.

- Woods, A. J., MacKenzie, K. J., Watt, S. J., Holliman, N. S. & Dodgson, N. A. (2010). Eliminating accommodation-convergence conflicts in stereoscopic displays: Can multiple-focal-plane displays elicit continuous and consistent vergence and accommodation responses? , 7524, 752417-752417-752410.
- Wozniak, S. (1976). Breakout (Version Arcade) [Video Game]. Sunnyvale, CA: Atari Inc.
- Youngblut, C. (2003). *Experience of Presence in Virtual Enviroments* (Report: IDA Document D-2960): Institute for defense analyses.
- Zerebecki, C., Stanfield, B., Hogue, A., Kapralos, B. & Collins, K. (2013). *S3D depth-axis interaction for video games: performance and engagement*. Paper presented at the Stereoscopic Displays and Applications XXIV, Burlingame, CA.
- Zhai, S. (1998). User performance in relation to 3D input device design. *ACM SIGGRAPH Computer Graphics*, 32(4), 50-54.
- Zhai, S., Kandogan, E., Smith, B. A. & Selker, T. (1999). In search of the 'magic carpet': Design and experimentation of a bimanual 3D navigation interface. *Journal of Visual Languages and Computing*, 10(1), 3-17.
- Zwaan, R. A. & van Oostendorp, H. (1993). Do readers construct spatial representations in naturalistic story comprehension? *Discourse Processes*, 16(1-2), 125-143.
- Zwrick, W. R. & Velicer, W. F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, 99, 432-442.

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