Using VR and simulation to enable agile processes for safety-critical environments M. Louka /IFE
Some references

Books on AR, VR, 3DUI:

[1] Aukstakalnis, S. (2017) *Practical Augmented Reality*, ISBN-13: 978-0-13-409423-6. USA: Addison-Wesley / Pearson Education, Inc.

Regardless of the title, this book provides a good introduction to technology, applications, and human factors for both VR and AR.

[2] Jerald, J. (2015) *The VR Book: Human-Centered Design for Virtual Reality.* ISBN: 978-1-97000-112-9. New York, NY, USA: ACM and Morgan & Claypool Publishers.

An excellent introducton for new and old researchers, designers, and developers, provides helpful guidelines on designing VR systems, with references to research that supports those guidelines. More focus on how to apply a human-centred design process than other VR books.

[3] LaViola Jr., J.J, Kruijff, E., McMahan, R.P, Bowman, D. , & Poupyrev, I. (2017) *3D User Interfaces (second edition)*, ISBN-13: 978-0-13-403432-4. USA: Addison-Wesley / Pearson Education, Inc.

Very useful book on 3D user interface design in general. Good book for learning about the challenges of 3D UI design but also as an introduction to how to evaluate 3D user interfaces effectively.

Compendium of articles for researchers:

[4] Hale, K.S. and Stanney, K.M (eds.) (2015), *Handbook of Virtual Environments (2nd Edition),* ISBN-13: 978-1-4665-1184-2. Boca Raton, FL, USA: CRC Press LLC.

Expensive but very useful collection of articles on a broad range of subjects. While 3 years old now, it is still relevant and offers convenient access to lots of litterature review type articles on jut about every topic relecant to VR & AR.

Useful articles related to some topics mentioned in my talk:

[5] Deininger. M., Daly. S.R., Sienko, K.H., and Lee, J.C. (2017) Novice designers' use of prototypes in engineering design, *Design Studies,* 51, pp. 25–65.

[6] Hilton, E., Linsey, J., and Goodman, J. (2015) Understanding the prototyping strategies of experienced designers. In *IEEE Frontiers in Education Conference (FIE), 2015.*

[7] 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, 1–130.

[8] Banks M. S., Kim J., Shibata T. (2013) Insight into Vergence-accommodation Mismatch. In *Proceedings of SPIE* , 8735.

[9] Szőke, I., Louka, M.N., Bryntesen, T.-R., Edvardsen, S.T., and Bratteli, J. (2014) Comprehensive support for nuclear decommissioning based on 3D simulation and advanced user interface technologies, *Journal of Nuclear Science and Technology* , 52:3, 371-387.

I have written two fairly detailed reports for the OECD Halden Reactor Project (HWR-1133 & HWR-1213) on using VR and virtual protopying in human-centred design processes for designing control centres. I intend to publish information from those reports in future as IFE has been given permission for broader publication of OECD HRP results. We at IFE are also working on a couple of articles on the Bane NOR project which will hopefully be published earlier next year.

They will eventually appear here: https://www.researchgate.net/profile/Michael_Louka

Examples of other earlier work that has been published externally (some of which is getting a bit old now, or only focusses on rather specific issues) include:

[10] Louka, M. N., Gustavsen, M. A., and Edvardsen, S. T. (2006) Using Virtual Reality to Support Multi-participant Human-Centered Design Processes for Control Room Design. In *Proceedings of 5th International Topical Meeting on Nuclear Plant Instrumentation, Controls, and Human Machine Interface Technology (NPIC&HMIT 2006)* at the American Nuclear Society 2006 Meeting, 12-16 November 2006, Albuquerque, NM, USA: American Nuclear Society.

[11] Drøivoldsmo, A. and Louka, M. N. (2011) Virtual Reality Tools for Testing Control Room Concepts. In B. G. Liptak (ed.), *Instrument Engineers' Handbook: Process Software and Digital Networks* (Volume 3, 4th Edition), ISBN 9781439817766. Boca Raton, FL, USA: CRC Press LLC.

[12] Louka, M. N. (2015) Using Virtual Mock-ups and Automated Verification Assistance to Support Human Factors Engineering Evaluation Activities for Control Rooms Layouts. In *Proceedings of the Ninth American Nuclear Society International Topical Meeting on Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies, NPIC&HMIT 2015, Charlotte, North Carolina, February 2015.* LaGrange Park, IL: American Nuclear Society.

For those (few!) that have access to OECD HRP Reports:

[13] Louka, M.N. & Winger, T. (2016) *Using Virtual Mock-ups to Support a Human-Centred Control Room Design Process (HWR-1144).* Halden, Norway: OECD Halden Reactor Project.

[14] Louka, M.N., Winger, T., & Braseth, A.O. (2018) *Using Virtual Reality to Support Preliminary Validation Tasks in a Human-Centred Control Room Design Process (HWR-1213).* Halden, Norway: OECD Halden Reactor Project.