Curriculum Vitae



ULUGBEK ISMATULLAEV

PhD Candidate | Product R&D Researcher | Product Designer | UX Researcher
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ABOUT ME

I'm a product designer and UX researcher. I study how people live, identify their needs and pain points, develop design concepts to address them, and translate those concepts into engineering specifications that define robot behavior, interfaces, and requirements. My path runs from automation and control engineering in Uzbekistan, to industrial engineering and human factors at KIT, to a PhD in human-centered design and technology at UNIST.

Since 2021, I have worked on funded projects at UNIST, in collaboration with Shinsung Delta Tech, JD Works, LG Electronics, NH Co., Ltd., Intenxiv, and others. In these projects, I help to research, design, and develop a care robot, combat backpack, special-forces sleeping bag, dysphagia rehabilitation device, smart food waste disposer, and AI design platform grounded in evidence-based research and human-centered design.

EDUCATION

Feb. 2022 – Feb. 2027	**PhD.** Human-Centered Design and Technology, UNIST, Ulsan, South Korea. **Graduation thesis title:** *"Scenario-Oriented Specification (SOS): A Design Method to Translate User Scenarios into Engineering Specifications."* **Advisor:** KwanMyung Kim; **Committee:** Philip Cash, Kilian Gericke, James Self, Kyung-Ho Lee.
Sep. 2019 – Aug. 2021	**M.Sc.** Industrial Engineering, Kumoh National Institute of Technology (KIT), Gumi, South Korea **Graduation thesis title:** *"Developing an Extended Technology Acceptance Model to Predict the Adoption of Autonomous Vehicles."* **Advisor:** Sang-Ho Kim.
Sep. 2014 – Aug. 2018	**B.Sc.** Automation and Control Engineering, Fergana State Technical University, Fergana, Uzbekistan **Graduation project title:** *"Automation of Device Adjustment for Enhancing the Energy Efficiency of Frequency Converters."*

EXPERIENCE

Mar. 2022 – Present	**Research Assistant (Product Design, UX Research).** Integration and Innovation Design (IID) Lab, Department of Human-Centered Design and Technology, UNIST, Ulsan, South Korea
Sep. 2021 – Feb. 2022	**Researcher (Product Design, UX Research).** Integration and Innovation Design (IID) Lab, Department of Human-Centered Design and Technology, UNIST, Ulsan, South Korea
Sep. 2019 – Aug. 2021	**Research Assistant (Interaction Design, Human Factors).** Interaction Design & Ergonomics Assessment (IDEA) Lab, KIT, Gumi, South Korea

PUBLICATIONS & PATENTS

Journal Articles

1. **Ismatullaev, U. V. U.**, & Kim, K. (2026). Scenario-Oriented Specification (SOS): a design method for translating user scenarios into engineering specifications. Research in Engineering Design 37(4), Article 36. https://doi.org/10.1007/s00163-026-00498-w
2. **Ismatullaev, U. V. U.**, Kim, S. H., & Maeng, K. (2026). Exploring user heterogeneity in autonomous vehicle acceptance: A moderated mediation model based on extended TAM. Transportation Research Part F: Psychology and Behaviour, 118, 103502. https://doi.org/10.1016/j.trf.2025.103502
3. **Ismatullaev, U. V. U.**, & Kim, S. H. (2024). Review of the factors affecting acceptance of AI-infused systems. Human Factors, 66(1), 126–144 (★2025 Clarivate ESI Highly Cited Paper). https://doi.org/10.1177/00187208211064707

Conference Articles

1. **Ismatullaev, U. V. U.**, & Kim, K. M. (2026). Toward an AI-Learnable Product Form Evaluation: Linking Design Language and Quantifiable Parameters. KSDS Conference Proceedings. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE12879273
2. **Ismatullaev, U. V. U.**, & Kim, K. (2025). Exploring the Role and Syntax of User Scenario Elements: Toward a Structured Framework for User-Centered Engineering Specifications. IASDR 2025. https://doi.org/10.21606/iasdr.2025.1104
3. Sarfraz, D., **Ismatullaev, U. V. U.**, & Kim, K. (2025). A Component-Based Approach for Developing Actions in Non-Humanoid Elderly Care Robots. IASDR 2025. https://doi.org/10.21606/iasdr.2025.1139
4. **Ismatullaev, U. V. U.**, & Kim, K. (2025). Scenario to specification: promises and pitfalls of AI in developing user-centered engineering specifications with interdisciplinary teams. Proceedings of the Design Society, 5, 2841-2850 (★Received Reviewers' Choice Award). https://doi.org/10.1017/pds.2025.10298
5. **Ismatullaev, U. V. U.**, & Kim, K. M. (2025). Making Use of User Scenarios in Developing User-Centered Engineering Specifications. KSDS Conference Proceedings. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE12271752
6. **Ismatullaev, U. V. U.**, Kwon, U., Kim, J., Lee, D., & Kim, K. (2025). Design Guidelines for Special Forces Sleeping Bags: Addressing User Needs in South Korea. In Congress of the International Ergonomics Association (pp. 209–217). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-96-8904-0_28
7. **Ismatullaev, U. V. U.**, & Kim, K. (2024). Introducing a framework to translate user scenarios into engineering specifications with “action steps”. Proceedings of the Design Society, 4, 23-34. https://doi.org/10.1017/pds.2024.5
8. Lee, D., Kim, J., Kwon, U. J., Saduakas, A., **Ismatullaev, U. V. U.**, & Kim, K. (2025). Device Design for Measuring Weight Distribution Performance of Military Backpacks. In Congress of the International Ergonomics Association (pp. 447–452). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-96-9334-4_66
9. **Ismatullaev, U. V. U.**, Barrera Garza, B. P., Lee, D., & Kim, K. M. (2022). A User-Centered Design Specification Method in New Product Development. KSDS Conference Proceedings. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE11186814
10. Kim, J., Kim, K., Saduakas, A., Barrera Garza, B. P., Lee, D., & **Ismatullaev, U. V. U.** (2023). Toward more considerate designing of home exercise equipment for older adults: a qualitative analysis of the specific needs and challenges of older adults for physical exercise. IASDR 2023. https://doi.org/10.21606/iasdr.2023.575
11. Lee, D., Kim, K., Saduakas, A., **Ismatullaev, U. V. U.**, Kim, J., & Barrera Garza, B. P. (2023). Dynamic personalities for elderly care robots: user-based recommendations. IASDR 2023. https://doi.org/10.21606/iasdr.2023.546
12. **Ismatullaev, U. V. U.**, Saduakas, A., & Kim, K. (2022). Human Factors Considerations in Design for the Elderly. In Jay Kalra (eds), Human Factors in Aging and Special Needs AHFE (2022) International Conference (Vol. 38, pp. 23–33). https://doi.org/10.54941/ahfe1001660
13. Saduakas, A., **Ismatullaev, U. V. U.**, & Kim, K. (2022). Addressing the Gaps in Elderly Falling Prevention from the Perspective of a Human-Centered Design. Human Factors in Aging and Special Needs, 38(38). https://doi.org/10.54941/ahfe1001675

14. **Ismatullaev, U. V. U.**, & Kim, S. (2021). An Extended Technology Acceptance Model for Investigating Factors Affecting the Adoption of Self-Driving Cars. Proceedings of the Ergonomics Society of Korea, 41–44. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE10589822
15. **Ismatullaev, U. V. U.**, Jo, I., & Kim, S. (2020). A Study on Identifying Human Factors in Collaboration with AI-Infused Systems. Proceedings of the Ergonomics Society of Korea, pp. 51–54. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE09412368
16. Shin, J. G., Heo, I. S., **Ismatullaev, U. V. U.**, & Kim, S. (2020). The influence of Human Factors on Subjective Emotion in Voice-based Human-AI interaction. Proceedings of the Ergonomics Society of Korea. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE10540311

Manuscripts upcoming/under review

1. **Ismatullaev, U. V. U.**, Lee, D., & Kim, K. (In Press). *"SOS Sprint: Translating user scenarios into engineering specifications with interdisciplinary teams".* DRS 2026: Design Research Society Conference.
2. **Ismatullaev, U. V. U.**, Sarfraz, D., Kim, J., Kim, H., & Kim, K. (Under Review). *"SOS Tool: Supporting human–AI scenario-to-specification work through trace-linked artifacts".* (SOS Tool: https://sos-tool-six.vercel.app)
3. **Ismatullaev, U. V. U.**, Ryu, R., Gabbas, M., Barrera Garza, B. P., Saduakas, A., Lee, D., Kim, S., Kim, J., & Kim, K. (Under Review). *"'I Am Still an Expert': The Moving Acceptability Frontier in Home-Robot Assistance for Older Adults".*
4. **Ismatullaev, U. V. U.**, Kim, J., & Kim, K. (In Preparation). *"Mechanisms of Decoupling: Effects of Generative AI on the collaboration and output in Interdisciplinary Design Work".*
5. Sarfraz, D., **Ismatullaev, U. V. U.**, Tufail, D., Karim, M., & Kim, K. (Under Review). *"Animate, Validate, Situate: Pre-Hardware Action Design for Non-Humanoid Robots".*
6. Lee, D., Kim, H., **Ismatullaev, U. V. U.**, Barrera Garza, B. P., Kim, J., Sarfraz, D., & Kim, K. (Under Review). *"From Personality Vocabulary to Expressive Cues: An Empirical Map for Designing Robot Personality".*

Patents

1. **Military Backpack***,* Korean Patent Application No. 10-2024-0139602 (published as 10-2026-0053831), pending. Co-inventor (Number of inventors: 6; Role: desk research, user research, concept development, testing), UNIST & NH Co., Ltd. https://doi.org/10.8080/1020240139602
2. **Backpack Frame,** Korean Registered Design No. 30-1290601 (2025). Co-creator (Number of creators: 6; *Role:* desk research, user research, concept development, testing), UNIST & NH Co., Ltd. https://doi.org/10.8080/3020240038213.M001
3. **Backpack Weight Distribution Measurement System,** Korean Patent Application No. 10-2025-0021221 (2025). Co-inventor (Number of inventors: 6; *Role:* desk research, testing, data analysis), UNIST & NH Co., Ltd. https://doi.org/10.8080/1020250021221

FUNDED PROJECTS

Jun. 2025 – Present **Development of Design-Production Process Collision Element Prediction and Optimization Solution Technology**; funded by the Korea Evaluation Institute of Industrial Technology (KEIT). *Role:* UX researcher; form and CMF evaluation framework and expert-workshop protocols for AI training datasets.

Nov. 2022 – Present **Combat sleeping bag;** funded by the Korea Research Institute for Defense Technology Planning and Advancement (KRIT). *Role:* UX researcher and product designer; literature review and benchmarking (desk research); user research with special-forces personnel; design guidelines, concept development, and design drawings; usability evaluation framework and testing.

Sep. 2021 – Dec. 2025	**Commercialization design and development of Intelligent Product-Service System for personalized full silver life cycle care (Lemmy)**; funded by the KEIT. *Role:* UX researcher and specification development lead; literature review, benchmarking, user research; development and evaluation of user scenarios, personas, activity modes, expression catalog; scenario-to-specification translation using SOS method; robot character and voice design.
Jan. 2022 – Dec. 2025	**Combat backpack**; funded by the KRIT. *Role:* UX researcher and product designer; literature review and benchmarking (desk research) on backpack design and weight distribution; design requirements development; frame concept development; weight distribution and usability testing and analysis.
Sep. 2023 – Mar. 2024	**Development of a kit to improve accessibility for installing food waste disposers and to check installation feasibility;** funded by LG Electronics. *Role:* product designer; experiments and analysis, CAD concepts, and a packaging-based installation check kit.
Sep. 2022 – Apr. 2024	**Umay: Data-based dysphagia rehabilitation training device;** funded by UNIST Smart Healthcare Center. *Role:* team leader and product designer; product design, sensor testing, 3D modeling, component layout and PCB integration, prototyping and testing.
Jul. 2020 – Sep. 2021	**AI-based user adaptive interaction;** funded by the National Research Foundation of Korea (NRF). *Role:* UX researcher; literature review, surveys, and technology-acceptance studies in AI-infused systems.

HONORS & RECOGNITIONS

CES 2025 Innovation Awards Honoree, Smart Home category (2025): Lemmy companion-care robot, developed in the MOTIE/KEIT project No. 20015056 (2021–2025) by UNIST, JD Works, and Shinsung Delta Tech. Role: UX researcher and lead researcher for scenario-to-specification work.

Reviewers' Choice Award, ICED25 (2025): for “Scenario to specification: Promises and pitfalls of AI in developing user-centered engineering specifications with interdisciplinary teams,” International Conference on Engineering Design, Texas, USA.

Highly Cited Paper, Clarivate Essential Science Indicators (2025): “Review of the factors affecting acceptance of AI-infused systems” (Human Factors, 2024), in the top 1% of cited papers in Psychiatry/Psychology.

TEACHING

DES232 3D CAD Modeling and Prototyping. Teaching Assistant (2026 Spring Semester). Undergraduate course. Classes taught: 1) Assembly & Engineering Drawing; 2) Product Rendering with KeyShot. Other roles: assignment checking and grading; student instruction in/out of class. Instructor: Prof. KwanMyung Kim, Department of Human-Centered Design and Technology, UNIST

DES214 Product Design I. Teaching Assistant (2023 Spring Semester). Undergraduate course. Key roles: assignment checking and grading; student instruction in/out of class. Instructor: Prof. KwanMyung Kim, Department of Human-Centered Design and Technology, UNIST

INVITED TALKS AND WORKSHOPS

Design Seminar (1 December 2026). *The co-evolution of theory and practice in design research*. UNIST Design Seminars 2026 Fall, Department of Human-Centered Design and Technology, UNIST, Ulsan, Republic of Korea, 1 December 2026; hosted by the Department of Human-Centered Design and Technology.

DRS2026 Explorations (June 2026, Workshop). *SOS Sprint: Translating user scenarios into engineering specifications with interdisciplinary teams.* Lead facilitator (co-facilitator: KwanMyung Kim). A 90-minute hands-on workshop with interdisciplinary teams of designers and engineers. Design Research Society Conference (DRS2026), 50 George Square, University of Edinburgh, Edinburgh, UK, 8 June 2026; hosted by the Design Research Society and the University of Edinburgh.

IASDR2025 (December 2025, Workshop). *Designing Personality of Social Robots*. Co-facilitator. Hands-on workshop with designers. IASDR 2025: Design Next, Songshan Cultural and Creative Park, Taipei, Taiwan, December 2025; co-hosted by TDRI and CID.

Asia Design Global Workshop (2023 Summer). *Re-Design*. Team member from the UNIST Department of Human-Centered Design and Technology, redesigning “bad design” within a 6,000-yen budget. Shibaura Institute of Technology, Tokyo, Japan.

REVIEWER ROLES

Designing Journal; Frontiers in Psychology; Design of Interactive Systems

METHODS, TOOLS, AND SKILLS

Research approaches: design science research; human-centered design; scenario-based design; requirements engineering and design specification; human factors and ergonomics; technology acceptance modeling (TAM); longitudinal case study; mixed methods; systematic literature reviews (PRISMA)

Qualitative methods: semi-structured interviews; contextual inquiry; focus groups; co-design and participatory workshops; participant observation; think-aloud protocols; thematic analysis; qualitative content analysis; affinity diagramming

Quantitative methods: Likert-scale surveys; structural equation modeling (SEM, PLS-SEM); multi-group and moderated mediation analysis; statistical power analysis; within-subjects user studies with standardized measures (SUS, NASA-TLX); anthropometric analysis; load-distribution testing

Design and visualization: SolidWorks, KeyShot (3D modeling and rendering); Figma (UI design); Adobe Illustrator, Photoshop, InDesign, PowerPoint (graphic design)

Sketching and photography: Procreate, Adobe Lightroom

Collaboration: Miro, FigJam

Prototyping and AI: functional web prototypes in HTML, CSS, and JavaScript (AI-assisted coding); LLM API integration (OpenAI, Anthropic)

Data analysis: Microsoft Excel (data management, descriptive statistics, charts); Python (data processing, statistics, and visualization); SmartPLS (PLS-SEM, multi-group analysis); ATLAS.ti, NVivo (qualitative coding and thematic analysis)

LANGUAGES

English (fluent), Korean (intermediate), Uzbek (native), Russian (intermediate)