

## ENG (Engineering)

The engineering genre deals with technology that is necessary to develop and operate computer entertainment systems, including technology for programing, graphics/rendering, how to understand and utilize hardware fully, and how to apply the mathematical sciences such as simulations. It also deals with ways to sustain the efficiency of development and operation, and relates to designing and building systems/services of a network and database, and to the prevention of illegal activities and security measures, as well as related cases.

### Topics sought for the ENG genre of CEDEC 2023

#### Development technology

- Graphics and rendering technology
- Technology enabling cross-platform development across generations (differences in hardware for each generation of consoles, etc.)
- Optimization of low layer and utilization of self-implementation in general-purpose game engines
- Research on machine learning and utilization examples in computer entertainment
- Technology and actual examples unique to the platform (PC, console, smartphone, Internet, and others)
- Communization and optimization of the game processes utilizing the cloud environment
- Examples of development environments for content creation (in-game editors, dedicated web services, etc.)
- Container/virtualization example designs of servers/networks
- Research/estimation methods of database bottleneck, tuning method
- Examples of high-volume resource/asset management and build pipelines
- General programing language
- Low-level programing (multi-core, multi-thread control, optimization, acceleration, memory management, and other)
- Examples and discussion of architecture design (domain-driven design, clean architecture, etc.)
- Optimization of compilers, toolchains, IDE, in-house tools, and others
- Utilization example of GPU (physics, deep-learning, and others)
- Examples specific to embedded devices
- Utilization example of procedure technology
- Testing/debugging techniques for software targeting a variety of devices such as Android ones
- Application examples for wireless communication (wireless LAN, Bluetooth, NFC, LPWA, private 5G, etc.)
- Development examples of large-scale on-line content and real-time communication competition content thru mobile devices
- Utilization examples of advanced web/network technologies (HTTP/2, HTTP/3, WebSocket, WebRTC, IPv6, and others)
- Design technology and test techniques dealing with network load, delay, loss, and others
- Efficient data mining techniques of big data (play logs and others), and utilization examples of a BI tool
- Explanation and utilization examples of server-less architecture
- Technology in the genre in much detail (VR, AR, physical simulation, AI, drawing, character control, collision, UI, and others)

- Countermeasures for server/service failure and maintenance
- Technology to detect illegal activity, and to protect digital content and services from illegal activity (DRM, encryption, cheat measures, and other)
- New interfaces for content using haptic technology and voice/image recognition
- Specific examples of improving software quality, such as test automation and QA efficiency
- Auto-adjustment of game-play catered to the user
- Application examples of block chain technology (NFT, data protection, etc.)
- Automatic generation method of stories and game levels
- Implementation of chatbot technology and dialog systems
- Virtualization or decentralization of building systems and development environments (Cloud-based asset build and binary build, etc.)
- Video distribution focused on 3D avatars, motion capture, interactive technology, metaverse building examples, etc.
- Examples of problem-solving in a development environment under remote working conditions (physical devices including target machines, displays, and input devices, server and communication environments at home, software licenses, etc.)

#### Commercializing leading-edge technologies

- Examples of various devices such as drones, AI speakers, wearable devices, and projectors utilized in entertainment
- The IoT and robotics in computer entertainment

#### Topics sought for tutorials

- Automation technology for server building/operation
- Introduction to modern graphics (GPU-driven rendering, etc.)
- Academic knowledge required for real-world application of machine learning (statistics, optimization methods, etc.)

## PRD (Production)

The Production genre covers concrete examples of the development process, methods and environments of product management, sharing and accumulation of knowledge, initiatives in education and development of human resources, etc. in computer entertainment.

### Topics sought for the PRD genre of CEDEC 2023

#### Process Management (Discussions Related to Process and Strategy)

- Initiatives to promote self-management on the project team project manager and their roles, and initiatives to delegate authority to the team
- Initiatives to sustain development and utilization of titles that are operated long-term
- Content and asset production using machine learning
- Efficient content/asset production via procedure technology
- Project manager and their roles, and initiatives to delegate authority to the team
- Examples of methods and process of prototyping in a large-scale development
- Examples of drawing up a workflow for a large-scale operation title

#### Practice (Discussions Related to Methods and Techniques)

- Methods for creating, managing, and sharing terabyte-sized data asset approaches, tools, and techniques to strengthen communication, team management, and improving productivity of development work during remote work
- Introduction and development of specialized tools for specific tasks to maximize team strengths
- Infrastructure development, including cloud utilization, for processes requiring large amounts of hardware resources, such as machine learning and large-scale authoring
- Quantification methods to grasp the condition of the project and teams
- Examples of technological contributions to improving the user experience that utilize information about developer and user behavior
- Test and QA engineering participation from the early stages of title development and mutual collaboration examples
- Examples of building a development environment where you can work safely without any interruptions caused by errors or failures
- Common infrastructure for automating testing and production operations across titles and departments
- Examples of titles with effort for automation in development
- Examples of software tests applying machine learning

#### Knowledge Management (Discussions Related to Knowledge and Know-How)

- Latest technologies and trends in the software development and information industry that can be applied to game development
- Initiatives for building and management of teams
- Effort for and effect of changing the organizational culture
- Education of managers and leaders and career development from other professions
- Personnel evaluation system that is suitable for diversified workstyles
- Human resource development and measurement of effectiveness for highly specialized and rare occupations
- Effective communication and information-sharing within the company
- Examples of information-sharing and community activity outside of the company

- Examples of promoting mutual understanding and enhancing psychological safety
- Approach from the development department for corporate branding
- Recruitment and onboarding customized to organizational culture

#### Topics sought for tutorials

- PMBOK utilization in game development
- JSTQB utilization in game development
- DevOps of game industry
- Implementation of test framework
- Concept of agility in game development
- Knowledge in building environment within development in a Cloud-dominated era

## VA (Visual Arts)

The Visual Arts genre covers representation of digital content in a wide sense, exploring new methods of expression and production flows in computer entertainment and methods of responding to a diversifying target base.

### Topics sought for the VA genre of CEDEC2023

#### Rendering expressions

- Examples of expression via shader material
- Expressions compatible with HDR displays
- Instances of state-of-the-art lighting techniques
- NPR expressions
- Examples of ray tracing technology

#### Model

- Sculpting modeling
- Modeling using capture technology
- Modeling methods using physical simulations
- Techniques for efficiently creating large-scale assets
- Examples of model and texture creation using procedure methods

#### Animation

- Animation utilizing AI
- RIG-related animation
  - Special animation expressions
- Methods of representing hand-drawn animation
- Innovative skinning methods
- Examples of creating animations with procedure methods

#### Effects

- Effect expressions in a PBR environment
- Instances of state-of-the-art effects
- Effect expression using dynamics
- Artistic particle control

#### Motion capture

- Motion-capture systems of various types of input equipment
- Performance capture
- Real-time character performance
- Coordination with game engines
- Facial capture/hand capture

#### GUI

- Automation and know-how on localization/culturalization
- Interface design based on UI/UX
- UI design for the VR/AR/MR environment
- Attractive UI design methods
- Universal design

#### Visual works, artist collection

- Character design
- Concept art
- Design works
- Previs (previsualization)
- CI of design asset

#### Simulations

- Utilization of fluid and atmosphere simulations, etc.
- Utilization of demolition simulations
- Simulated representations of vegetation, etc.
- Other examples of using simulations to improve efficiency and expression

#### Technical art

- Selective asset system utilizing AI
- Examples of quantitative evaluation of pipeline installations
- Use of DCC tools, migration cases
- Development environment building
- Scalable performance tuning
- Asset management, authoring-related cases
- Visual expression with new technology
- Common authoring system for video and game production

#### Others

- Visual expression of VR/AR/MR
- Content production using 3D printers
- Visual expressions in multimedia applications (video, games, theater, etc.)
- Efficient reuse of legacy assets
- Video production in game engines, examples of applications outside of games
- Examples of industry-academia cooperation in the visual arts field
- Visual expression of esports
- New expressions produced through collaboration with other genres
- Optimization methods for mobile games
- Support for a wide variety of user environments, ranging from 2kSDR to 8kHDR
- Multi-platform support
- Know-how in work environments, such as devices used by artists
- Creation of assets, animations, etc. using machine learning
- Education and learning in all the above genres

#### Topics sought for tutorials

- Tips presentation boot camp in VFX, TA, and procedure
- Scan, capture, sculpting method, and workflow
- Basic expression to be the template of visual expression
- Visual expression utilization of machine learning and AI
- Tool optimization in scripting language such as Python

## BP (Business & Producing)

The business & production field includes examples of success for computer entertainment as seen from a business angle, the environment around pro gamers and esports, successful and unsuccessful examples from a business viewpoint, funding, all kinds of analysis, sales techniques, rights issues, game programming training business, etc. and handling of expertise that is not limited to technology for game title production.

### Topics sought for the BP genre of CEDEC2023

- Use of NFT and other block chain technologies
- The metaverse and computer entertainment
- Changes in needs for human resources that takes remote environments into consideration
- Business management that takes remote environments into consideration
- Analysis of market including titles and user trends
- Education for game creators targeted towards young people, both in Japan and overseas
- Community building/community management both online and in real life
- Diversification of billing and business schemes
- SDGs (Sustainable Development Goals) and ESG (Environmental, Social and Governance) initiatives
- Diversification of work styles
- Balance between games and personal life
- Intellectual property rights of AI learning data
- Digital marketing that does not rely on IDFA and AAID
- Examples of prize system computer entertainment such as esports
- Matters of legal consideration regarding younger age groups such as parental controls
- Examples of programing education utilizing computer entertainment
- Diversification of game development methods for individuals and small-scale businesse
- Examples of and proposals for computer entertainment that utilizes 5G
- Examples of and proposals for cases utilizing Edge AI
- Examples in GDPR correspondence
- Ethical perspective of game contents
- Proposals from localization and culturization businesses
- License management and legal examples
- Examples and proposals related to business morals
- Examples of success from Japan in overseas markets

- \* Both proposals and case studies are included.
- \* The examples in each item include successful/unsuccessful cases

## SND (Audio)

The Sound genre covers production technologies and examples of all aspects of game sounds in computer entertainment, such as interactive uses of sound, production of music and sound effects, recording and editing of voice and music including Foley, the work flow of asset management and implementation, localization, as well as signal processing and spatial audio technologies (including virtual surround).

### Topics sought for the SND (Audio) genre of CEDEC2023

Topics of particular interest sought for the SND (Audio) genre

- Examples of new concept proposals and endeavors related to acoustic effects
- Examples of improvements made to immersive spatial expression through sound, whether during the pre-rendering phase or in real-time
- Examples of interactive/generative sound control and pronunciation implementation (physics-based, animation-linked, physical modeling, etc.)
- Interactive music production, dynamic generation and synthesis
- Utilization examples of machine leaning and deep learning in audio
- Examples of automation/optimization of developing tool/authoring environment, and interworking with other software
- Examples of remote sound production

### Basic topics sought for the SND (Audio) genre

- Game sound production (music production, sound effects production, in-game mixing, sound direction, sound production)
- Voice (voice recording to insertion, voice direction, localization, examples of using voice synthesis/input/voice chat)
- Sound programming (examples of tool production / application and research & development)
- Development environment (personnel adjustment / cost/deadlines, work flow, cooperation with other work categories, QA, etc.)
- Business (legal knowledge relating to music copyright law, regulations and administration works)
- Examples of immersive productions that integrate haptics and sound

### Topics sought for tutorials

- The latest trends in immersive audio
- Basic knowledge to utilize machine learning in game sounds
- Fundamental knowledge of important concepts and attitudes in sound development
- Fundamental knowledge of the latest sound development technologies

**In the genre of Game Design, discussions will be held over mindsets, actions and considerations required to design games that are truly entertaining and move users' hearts. Experts will share their views backed up by their broad practical knowledge, analytical views, insight and unique, valuable experiences.**

**Topics sought for tutorials**

- Usage of a new tool for game designs
- Development methods and design experiences leading to the production of an epoch-making game
- Things to learn from gaming design history for further advancement

**Topics sought for the GD genre of CEDEC2023**

- Game design based on the premise of worldwide presentation
- Examples of AAA title development and game design
- Methods for progressing to open-world games for each game genre
- Diversification of game design in indie games
- Narrative expression without language, environmental storytelling, etc.
- Game design providing interaction with viewers of gameplay streaming videos
- Examples of applying AI for optimization
- Mechanics design adopting machine learning
- Relationship between esports events and game designs
- Simulation techniques for better VR experience
- Games using aspects of cognitive science such as misperceptions and sensory interactions
- Game design with haptic feedback
- Game design for achieving XR
- Well-thought out game designs in creating continuously popular series products
- Game design to resurrect the IP that was once discontinued
- Game design utilizing SNS and video services
- Game design incorporating thinking behind behaviors such as economics or psychology
- Game design for specific age groups like younger children and the elderly
- Instances of highly entertaining serious games
- Game design pursuing merit/benefit in the real world
- Game design based on the differences in play tendencies between genders
- Game design for converting existing contact-type real entertainment into online version
- Game design transition and analysis in mobile games
- Game design focused on 'survival' rather than 'defeating enemies'
- Examples of games enabling continuous user acquisition
- Mechanics design in the initial development and operation that enabled long-term operation
- Examples of unsuccessful cases in game development and operation, and successful cases of improving with that mistake in mind
- Examples of aggregated operational game design
- Techniques for training game designers
- Educational tools to improve game designers' skills
- Examples of UE5 and Unity game designer applications and education
- Applied game technology for home appliances
- New examples of UX occurring in video content
- Media art that provides a totally new user experience
- Challenge of finding new genres completely unlike existing games
- Game design that can be utilized in education
- Game design compliance
- Discussion technique of game design according to the prevalence of telework and chat tools
- Game designs unique to the cloud game platform
- Examples of game design patents and search methods
- Game design with cross-platform systems
- Concrete examples of game designs together with a new

---

**AC (Academic/Fundamental Technologies)**

---

The Academic/Fundamental Technologies genre deals with the application of new and existing technologies, which cannot be thought about from the perspective of the entertainment industry. Also covered in this genre are the outcomes of elemental technologies and academic and business research that form the basis for the development of entertainment content.

**Topics sought for the AC genre of CEDEC2023****Cutting-edge interaction technology**

- Interaction technologies applicable to entertainment
- Interaction technology that creates a remote co-experience
- Interaction technologies using sensations such as auditory, tactile and olfactory senses
- Interaction technologies using virtual characters/avatars
- Systems using body information (fingerprint, retina, pulse rate, skin conduction, brainwaves, eyes, etc.)
- Technology for expanding experiences or ability and research examples (Augmented Human Technology, Superhuman Sports)
- Application of 3D printing and rapid prototyping technologies in entertainment content

**Cutting-edge display technology**

- State-of-the-art information display technologies and research examples (displays, HMD, projection systems, etc.)
- The latest technologies for Head Mounted Display and research examples making use of its characteristics

**Fundamental Technologies**

- AI and human co-creation support technology for content creation in entertainment
- Next technology to follow VR/AR/MR, and its utilization method
- Fundamental technologies and knowledge for VR/AR/MR and the metaverse
- Sensing technology acquiring human movements and emotions
- Examples of evaluation methods, evaluation technology, and evaluation analysis of entertainment
- Relationship-building between entertainment content and humans backed by cognitive science, behavioral psychology, etc.
- Mechanism and application methods of human interface devices
- Knowledge of tools for creating entertainment content or the development of tools
- Mechanism and application methods of human interface devices
- Technologies and news topics about producing content using remote equipment, such as drones
- Technologies and topics about ensuring accessibility
- New game design that expands the frame of existing games

**Applications in combination with other fields**

- Applied research on entertainment for education and welfare, etc.
- Applications of wearable systems and robot technology from the wider field of engineering for entertainment
- Humanities research on entertainment and its utilization method

**Topics sought for tutorials**

- The latest trend of every kind of display technology
- Trends and technology prospects related to the metaverse
- Configuration method of expressions and experiences utilizing sense of touch
- Experimental design and statistical method for experimental data analysis