


**Detailed information on patents**

**WayneHills Bryant AI**

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# 01. List of patents holding

Service(BM)	Video Creation	Transfer from Samsung Electronics
Database	UI/UX	BCI

No.	Country code	Legal status	Appl.No.	Filed date	Name of the invention	Applicant
1	KR	Public	2022-0062580	2022.05.23	An Apparatus For Providing Video Content Production Service Using Resource Conversion Matching Of Multimedia Collected In Metaverse Environment	WayneHills Bryant AI, Inc.
2	KR	Public	2022-0062579	2022.05.23	A Method And Recording Medium For Providing Video Content Production Service Using Resource Conversion Matching Of Multimedia Collected In Metaverse Environment	WayneHills Bryant AI, Inc.
3	WO	Public	PCT/KR2021/019794	2021.12.24	Method And Device For Providing Converted Multimedia Content Creation Service Using Image Resource Matching Of Text Converted From Speech Information	WAYNEHILLS.VENTURES. CO.LTD
4	KR	Registered	2021-0179466	2021.12.15	<b>An Apparatus For Providing A Producing Service Of Transformed Multimedia Contents Using Matching Of Video Resources</b>	WayneHills Bryant AI, Inc.
5	KR	Registered	2021-0179465	2021.12.15	<b>A Method For Providing A Producing Service Of Transformed Multimedia Contents Using Matching Of Video Resources</b>	WayneHills Bryant AI, Inc.
6	KR	Registered	2021-0179464	2021.12.15	<b>An Apparatus For Providing A Producing Service Of Transformed Multimedia Contents Using Matching Of Video Resources</b>	WayneHills Bryant AI, Inc.
7	WO	Public	PCT/KR2021/018046	2021.12.01	Method For Providing Service Of Producing Multimedia Conversion Content By Using Image Resource Matching, And Apparatus Thereof	WAYNEHILLS.VENTURES. CO.LTD
8	WO	Public	PCT/KR2021/011413	2021.08.26	Multimedia Automatic Generation System For Automatically Generating Multimedia Appropriate For User Voice Data By Using Artificial Intelligence	WAYNEHILLS VENTURES. CO., LTD.
9	KR	Public	2021-0035638	2021.03.19	A System For Providing A Service That Produces Voice Data Into Multimedia Converted Contents	WayneHills Bryant AI, Inc.
10	KR	Public	2021-0035637	2021.03.19	Apparatus For Providing Multimedia Conversion Content Creation Service Based On Voice-Text Conversion Video Resource Matching	WayneHills Bryant AI, Inc.

- WayneHills Bryant AI holds 44 KR patents, 8 PCTs, and 1 US patent.
- Pending patent applications in 5 technical fields related to video creation.

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Service(BM)	Video Creation	Transfer from Samsung Electronics
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No.	Country code	Legal status	Appl.No.	Filed date	Name of the invention	Applicant
11	KR	Public	2021-0035636	2021.03.19	A An Apparatus For Providing A Producing Service Of Transformed Multimedia Contents	WayneHills Bryant AI, Inc.
12	KR	Public	2021-0035635	2021.03.19	Method Of Providing Production Service That Converts Audio Into Multimedia Content Based On Video Resource Matching	WayneHills Bryant AI, Inc.
13	KR	Public	2021-0035634	2021.03.19	A Method Of Providing A Service That Converts Voice Information Into Multimedia Video Contents	WayneHills Bryant AI, Inc.
14	KR	Public	2021-0035633	2021.03.19	A Method Of Providing A Service That Converts Voice Information Into Multimedia Video Contents	WayneHills Bryant AI, Inc.
<b>15</b>	<b>KR</b>	<b>Registered</b>	<b>2021-0035632</b>	<b>2021.03.19</b>	<b>A Method For Providing A Producing Service Of Transformed Multimedia Contents Using Matching Of Video Resources And An Apparatus Using It</b>	<b>WayneHills Bryant AI, Inc.</b>
16	KR	Public	2020-0168484	2020.12.04	Production Interface Device For Multimedia Conversion Content Production Service Providing Device	WayneHills Bryant AI, Inc.
17	KR	Public	2020-0168469	2020.12.04	Resource Database Device For Document-Based Video Resource Matching And Multimedia Conversion Content Production	WayneHills Bryant AI, Inc.
18	KR	Public	2020-0168461	2020.12.04	Method For Building A Resource Database Of A Multimedia Conversion Content Production Service Providing Device	WayneHills Bryant AI, Inc.
19	KR	Public	2020-0168458	2020.12.04	System For Providing Services To Provide Multimedia Content Conversion Services	WayneHills Bryant AI, Inc.
20	KR	Public	2020-0168439	2020.12.04	Program Recorded Medium For Providing Service	WayneHills Bryant AI, Inc.

- We have 15 registered patents, and 22 patents are currently public.
- All 15 registered patents are KR patents, and PCTs are currently under examination.

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Service(BM)	Video Creation	Transfer from Samsung Electronics
Database	UI/UX	BCI

No.	Country code	Legal status	Appl.No.	Filed date	Name of the invention	Applicant
21	KR	Public	2020-0168427	2020.12.04	Program For Providing Service	WayneHills Bryant AI, Inc.
22	KR	Public	2020-0168421	2020.12.04	Method For Providing Automatic Document-Based Multimedia Content Creation Service	WayneHills Bryant AI, Inc.
23	KR	Public	2020-0168417	2020.12.04	An Apparatus For Providing General Document-Based Multimedia Image Content Production Service	WayneHills Bryant AI, Inc.
24	KR	Public	2020-0168410	2020.12.04	Program Recording Medium For Providing Services That Convert Documents Into Multimedia Contents	WayneHills Bryant AI, Inc.
25	KR	Public	2020-0168402	2020.12.04	A Program For Providing Multimedia Contents Production Service	WayneHills Bryant AI, Inc.
26	KR	Public	2020-0168390	2020.12.04	A Method For Providing Producing Content Service Of Transform Documents Into Multimedia Contents	WayneHills Bryant AI, Inc.
27	KR	Registered	2020-0112536	2020.09.03	<b>Multimedia Automatic Generation System For Automatically Generating Multimedia Suitable For User'S Voice Data By Using Artificial Intelligence</b>	<b>WayneHills Bryant AI, Inc.</b>
28	US	Abandoned	17-413180	2019.12.11	Digital Live Book Production System	WAYNEHILLS VENTURES LLC
29	KR	Registered	2018-0158954	2018.12.11	Digital Live Book Production System	YI, Su Min
30	KR	Registered	2016-0138663	2016.10.24	Digital Contents Providing Method And Apparatus	Samsung Electronics Co., Ltd.
31	KR	Registered	2016-0054063	2016.05.02	Apparatus And Method For Displaying Multimedia Contents	Samsung Electronics Co., Ltd.

- In addition, We hold 12 patents transferred from Samsung Electronics, of which 9 are registered.

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Service(BM)	Video Creation	Transfer from Samsung Electronics
Database	UI/UX	BCI

No.	Country code	Legal status	Appl.No.	Filed date	Name of the invention	Applicant
32	KR	Registered	2012-0066319	2012.06.20	Apparatus And Method For Providing Time Machine In Cloud Computing System	Samsung Electronics Co., Ltd.
33	KR	Registered	2012-0010324	2012.02.01	Apparatus And Method For Encoding/Decoding Using Virtual View Synthesis Prediction	Samsung Electronics Co., Ltd.
34	KR	Registered	2011-0103310	2011.10.10	Apparatus And Method For Multimedia Service, And Therefor Computer-Readable Medium	Samsung Electronics Co., Ltd.
35	KR	Registered	2011-0082486	2011.08.18	Apparatus And Method For Supporting Family Cloud In Cloud Computing System	Samsung Electronics Co., Ltd.
36	KR	Registered	2011-0073219	2011.07.22	Simulation Apparatus And Simulation Method Thereof	Samsung Electronics Co., Ltd.
37	KR	Lapsed	2011-0001704	2011.01.07	Apparatus And Method For Audience Measurement In Multimedia Streaming System	Samsung Electronics Co., Ltd.
38	KR	Lapsed	2010-0060175	2010.06.24	Apparatus And Method For Marking Documents With Executable Text	Samsung Electronics Co., Ltd.
39	KR	Lapsed	2007-0073507	2007.07.23	3D Content Reproducing Apparatus And Controlling Method Thereof	Samsung Electronics Co., Ltd.
40	KR	Registered	2007-0065415	2007.06.29	Hand-Writable Electronic Book	Samsung Electronics Co., Ltd.
41	KR	Registered	2006-0054916	2006.06.19	Method For Generating Automatic Multimedia Story And Apparatus Thereof	Samsung Electronics Co., Ltd.
42	KR	Unpublished	2023-0132493	2023.10.05	Neural Network Signal Based Artificial Intelligence Automated Content Creation/Synthesis Method	WayneHills Bryant AI, Inc.

- The 12 patents have technical features related to multimedia services.

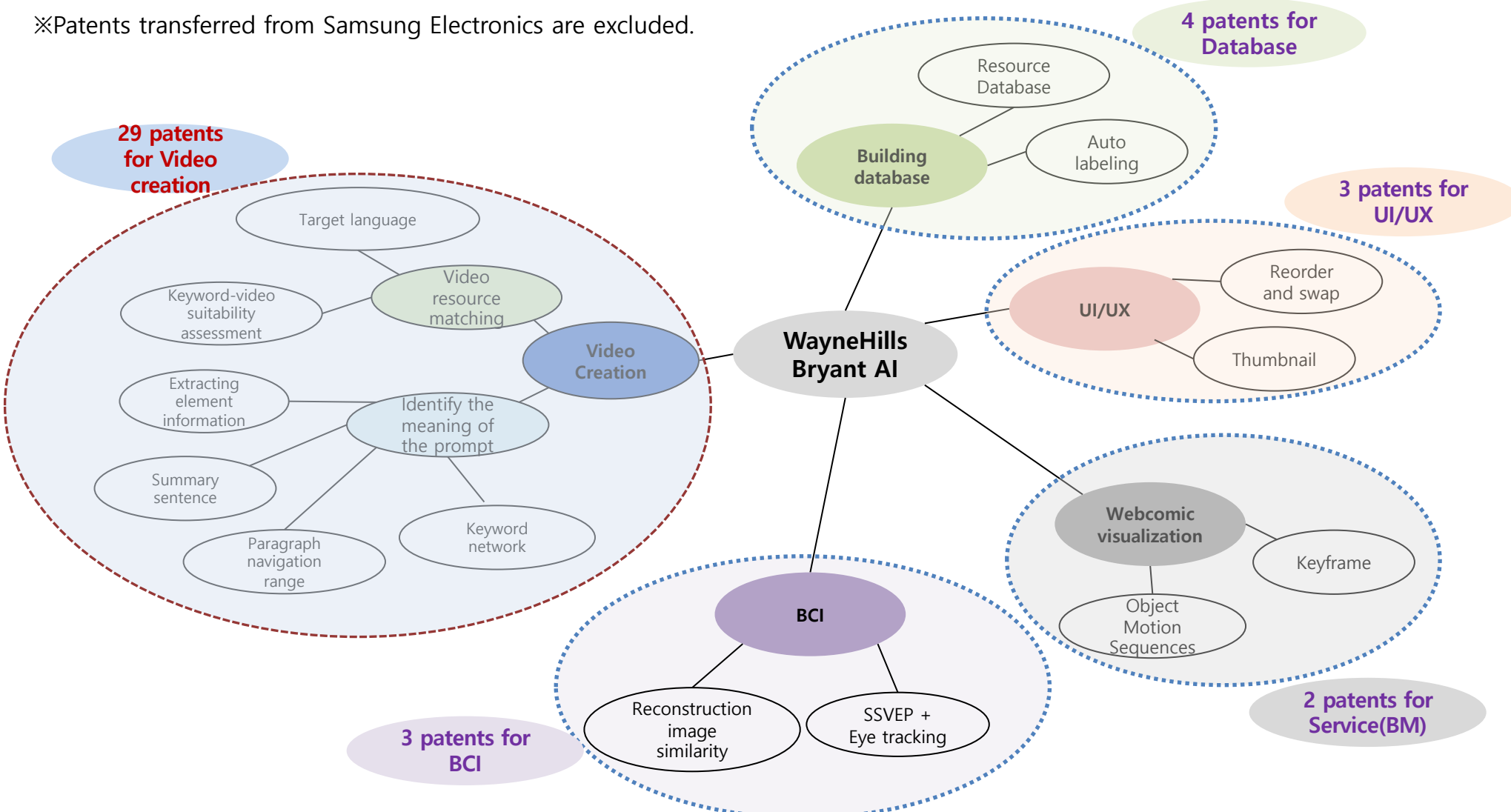
# 01. List of patents holding

Service(BM)	Video Creation	Transfer from Samsung Electronics
Database	UI/UX	BCI

No.	Country code	Legal status	Appl.No.	Filed date	Name of the invention	Applicant
43	WO	Unpublished	PCT/KR2023/016889	2023.10.27	Neural Network Signal Based Artificial Intelligence Automated Content Creation/Synthesis Method And Electronic Device Performing The Same	WayneHills Bryant AI, Inc.
44	WO	Unpublished	PCT/KR2023/016892	2023.10.27	Neural Network Signal Based Artificial Intelligence Automated Content Creation/Synthesis Method And Multimedia Generation System Performing The Same	WayneHills Bryant AI, Inc.
45	WO	Unpublished	PCT/KR2023/017766	2023.11.07	Electronic Device Providing Multimedia Content Based On Text Analysis Results Based On Artificial Intelligence Model And Method Thereof	WayneHills Bryant AI, Inc.
46	WO	Unpublished	PCT/KR2023/017772	2023.11.07	Server Providing Multimedia Content Based On Text Analysis Results Based On Artificial Intelligence Model And Method Thereof	WayneHills Bryant AI, Inc.
47	WO	Unpublished	PCT/KR2023/017767	2023.11.07	System Providing Multimedia Content Based On Text Analysis Results Based On Artificial Intelligence Model And Method Thereof	WayneHills Bryant AI, Inc.
48	KR	Unpublished	2023-0165378	2023.11.24	Database Building Device For Multimedia Content Creation And Operating Method Therefor	YI, Su Min
49	KR	Unpublished	2023-0165379	2023.11.24	Database Building System For Multimedia Content Creation And Operating Method Therefor	YI, Su Min
50	KR	Unpublished	2023-0170904	2023.11.30	Electronic Device For Providing User Interface For Multimedia Content Creation And Operating Method Therefor	YI, Su Min
51	KR	Unpublished	2023-0170916	2023.11.30	Server For Providing User Interface For Multimedia Content Creation And Operating Method Therefor	YI, Su Min
52	KR	Unpublished	2023-0170918	2023.11.30	Method For Creating Animation Using webcomic Images And Device For Performing The Same	YI, Su Min
53	KR	Unpublished	2023-0170923	2023.11.30	Method For Creating Animation Using webcomic Images And Animation Creation System For Performing The Same	YI, Su Min

- **Recently completed patent applications in 5 technical fields to strengthen our patent portfolio.**

※Patents transferred from Samsung Electronics are excluded.



- WayneHills Bryant AI has a patent portfolio covering 5 technical fields related to video content creation services using AI.



No	Tech. field	Elements	Description
1	Video creation	Extracting element information	Text-based extraction of key element information based on preset natural language processing algorithms
2		Summary sentence	Generating summary sentences using extractive and abstract summary methods
3		Paragraph navigation range	Determining the range of paragraph navigation based on keyword attributes for efficient data processing in prompts
4		Keyword network	Using keyword networks to identify semantic connection between multiple paragraphs
5		Video resource matching	Resource content matching algorithms that yield the most optimized relevance
6		Target language	Creating language-appropriate multimedia content for each country
7		Keyword-video suitability assessment	Evaluating relevance considering the user's cumulative rating and the relationship between keywords, and determine relevance distance accordingly

- Patents in the field of video creation disclose 7 key technical features.
- Recently completed patent applications to solve the problem of matching the same video resource when paragraphs have the same contextual meaning by using keyword networks.

No	Tech. field	Elements	Description
8	DB	Resource Database	Building databases to facilitate analysis and sharing of data based on meta information
9		Auto-labeling	Labeling a source data with story keywords for the main objects identified in the source data, and determining the level of auto-labeling based on the complexity of the main objects
10	UI/UX	Reorder and swap videos	Providing an interface that provides the ability to reorder, move, or replace videos based on user input of the group identifier on the thumbnail
11		Thumbnail synthesis and recommendations	Automatically synthesizing thumbnails to match multimedia content and thumbnails recommendation interface output
12	BCI	Reconstruction image similarity	Identifying virtual keyboards based on similarity of reconstructed images generated based on GAN(Generative Adversarial Network)
13		SSVEP + Eye tracking	Creating validation zones for each virtual keyboard based on SSVEP + supplement with eye tracking signals
14	Webcomic visualization (BM)	Keyframe	Determining keyframes based on suitability scores for keystories and unit cuts
15		Motion Sequences	Motion sequences of objects + Background motion sequence based on camera viewpoint for objects

- The patents in the remaining 4 technical fields disclose 2 technical features per technical field.
- The detailed technical features of the patents in each technical field are described in the following resources.

## ◆ Patent details: Video Creation

### Purpose

- ✓ Solve a problem of **matching** consecutive **identical partial videos**.
- ✓ Resolve an issue that partial videos are not matched with contextual meaning when a paragraph's **core-keyword is a polysemous or homophonic word**.

### Effects

- ✓ Same partial video not matched.
- ✓ By accurately identifying the meaning of keywords that are polysemous, homophones, or words that can be interpreted in multiple ways, **matching partial videos to their semantics**.

### Solution

- ✓ **Solution 1: Keyword Network**
  - Solution (1-1) Optimizing text summaries: Utilizing both automatic summarization methods using **attributes based on the length of the text** and manual summarization methods based on user input.
  - Solution (1-2) **Merging similarly worded paragraphs into a single paragraph** as a result of text summarization
  - Specifically, for two paragraphs with the same core-keyword, the paragraph-specific keyword network determines whether the **context of the two paragraphs is different but the keyword is the same** (in which case merge X), or whether the **context of the two paragraphs is similar and the keyword is derived from the same source** (in which case merge O).
- ✓ **Solution 2: Identifying target meanings by applying dominant-dominated semantic role to homonyms and polysemous words.**
  - If a paragraph's core-keyword is a polysemous or homophonic word, it **converts the multiple candidate meanings into vectors and accurately identifies the target meaning among the multiple candidate meanings based on the sentence analysis range determined by the distance between the converted vectors**.

## ◆ Patent details: Database

### Purpose

- ✓ **Video resources that are less relevant to the prompt** are matched due to the lack of labeling data for stories in the DB.
- ✓ **Gain data processing efficiency** for auto-labeling.
- ✓ **Secure DBs for various contexts.**

### Effects

- ✓ **Provide video resources that are highly relevant to the prompt**
- ✓ **Highly efficient data processing** → **Increase productivity** of multimedia content creation services.
- ✓ **Reliable auto-labeling** → **Improve the quality** of multimedia content creation services.

### Solution

- ✓ **Solution 1: Story Keywords**
  - Solution (1-1) **Identifying stories** from extracted object features in the source data: Determining **at least one main object** among the objects, and determine **at least one story keyword** from behavioral information about the interaction of the center object with the surrounding objects.
  - Solution (1-2) Determining the **theme keywords associated with the story keywords** to filter out **video resources that are less relevant** to the prompt: Even if the keywords are the same, they may be less relevant depending on the **overall theme of the image/video, so label the theme keywords in addition to the story keywords.**
- ✓ **Solution 2: Determining the level of labeling based on the complexity of the object**
  - Determining the complexity of the main object based on edge information about the shape of the main object and texture information about the surface texture.
- ✓ **Solution 3: Validating labeling data, expanding database with 3D photorealistic video**
  - Solution (3-1) Primary verification based on **theme keyword-story keyword semantic associations** + Secondary verification based on **story associations between story keywords and main object information.**
  - Solution (3-2) Expanding the database by rendering 2D images and 3D animations into 3D photorealistic videos using Unreal Engine

## ◆ Patent details: UI/UX

### Purpose

- ✓ Provide a **reordering/replacement interface** for matched videos per paragraph with similar context.
- ✓ Provide a **thumbnail recommendation** interface for user-generated videos to easily upload to social media.

### Effects

- ✓ Increase **user satisfaction** with the multimedia content.
- ✓ Increase **user convenience** by eliminating extra thumbnail editing tasks for generated multimedia content.

### Solution

- ✓ **Solution 1: Reorder interface output based on contextual similarity**
  - Solution (1-1) Identifying **contextual similarities across** paragraphs in a prompt and display **group identifiers of the same shape on** thumbnails of videos with similar contexts.
  - Solution (1-2) Providing an interface that **provides the ability to reorder, move, or replace videos** based on **user input of the group identifier on the** thumbnail.
  - Specifically, providing the ability to reorder or move the video based on where the **drag input end zone for the selected group identifier**.
- ✓ **Solution 2: Automatically synthesizing thumbnails to match multimedia content and thumbnails recommendation interface output**
  - Solution (2-1) Using a **topic model (LDA)** to determine theme keywords that match the prompt, and determining **thumbnail titles using the determined theme keywords**.
  - Solution (2-2) Determining a **representative thumbnail by compositing the thumbnail title with the thumbnail image** determined based on the **viewing history information (SNS views, etc.)** of the video resources used in the multimedia content.

## ◆ Patent details: BCI

### Purpose

- ✓ Improve **character acquisition speed** based on BCI. (ITR improvement)
- ✓ Improve **character recognition accuracy** based on BCI.
- ✓ Addressing issues of fatigue, poor concentration, and epilepsy based on SSVEP.

### Effects

- ✓ **Improve ITR and accuracy** with BCI.
- ✓ **Improved accuracy** in measuring cumulative user fatigue and **reduced adverse electroconvulsive events**.

### Solution

- ✓ **Solution 1: Identifying virtual keyboards based on similarity of reconstructed images generated based on GAN + Candidate text output**
  - If a **GAN-based reconstructed character image** is generated by **imagining the character** without identifying the character with SSVEP (such as the existing P300 speller), it **immediately identifies the character area based on image similarity** → Output **candidate texts using** artificial intelligence models and guide the user to select them.
- ✓ **Solution 2: Creating validation zones for each virtual keyboard based on SSVEP + supplement with eye tracking signals**
  - **Create validation zones** per area **using the SSVEP**.
  - Complementary verification using eye-tracking signals
- ✓ **Solution 3: Measuring concentration based on eye aspect ratio and EEG signal intensity** → **Changing frequency bands or switching to refresh images when fatigue sets in**
  - Determines concentration level by measuring eye **closure time based on eye aspect ratio**, which also takes into account **brainwave intensity when** eyes are **open for** longer periods of time (Check for sleepiness with eyes open)
  - **Generally upscale the frequency band** used for BCI services (or provide a refresh image)

## ◆ Patent details: BM(Webcomic visualization)

### Purpose

- ✓ Which image from the webcomic images to keyframe?
- ✓ How to naturally connect linking frame images between keyframes.
- ✓ **Create webcomic with user intent.**

### Effects

- ✓ Determine the right keyframe image among the webcomic images.
- ✓ Allows for natural movement of the objects and background that make up a connected frame image
- ✓ **Can reflect user intent + complement user intent**

### Solution

- ✓ **Solution 1: Accurately determining the key frame, which is the core frame of the webcomic video**
  - Solution (1-1) Don't use all cuts in the webcomic as candidate frame images. **Combine the nested boxes and set the combined box images(= unit cuts) as candidate frame images.**
  - Solution (1-2) Apply CNN to a keyframe image to detect objects. → Estimate keystorey from RNN, LSTM, and natural language processing models using text on keyframe images and CNN detection results as input. → Determine keyframes based on suitability scores for keystoreys and unit cuts. **(Don't keyframe every cut, just the ones that make sense for keystoreys.)**
- ✓ **Solution 2: Motion sequences of objects + Background motion sequence based on camera viewpoint for objects**
  - **Determine keyframe objects** based on **the type of keyframe object**. + Determines the motion sequence of connected frame objects based on **the amount of change in pose information** for each object in the keyframe. + **Identify camera viewpoints** for keyframes and connected frame objects. → **Determine motion sequences for background objects based on camera viewpoint.**
- ✓ **Solution 3**
  - **Supplement user prompts with key stories** determined from webcomic images, and generate webcomic videos based on the supplemented stories.

