Designing The Future

KDDI

Possibility of Research Collaboration between Indian Research Institutes and KDDI R&D Labs.

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Ubiquitous Solution Company

KDDI Corporation

Research Collaboration

KDDI would like to support for a research collaboration between Indian Research Institutes and KDDI R&D Labs. for developing future ICT industry.

KDDI R&D Labs. has carried out research on ICT technologies from basic research to applied technology for over 57 years.

Activities of KDDI R&D Laboratories (Major topics)
- ・Next gen. Infra-structure（Convergence of Wireless NW and Photonic NW）
- ・Operation technologies of all-IP(IPv4/v6) NW (network control, quality control)
- ・Security for Data (Cipher), Network & Open devices
- ・Advanced User Interface, such as Voice recognition
- ・FMBC Application, Video contents technology

Topics of Research Collaboration

Possible Research Collaboration

+ Timely contribution to future ICT industries
+ Matching abundant researchers resource in India with key elemental technologies in KDDI

⇒ **Advanced ICT software research & development**

Candidates of Areas and Topics

(1) Video

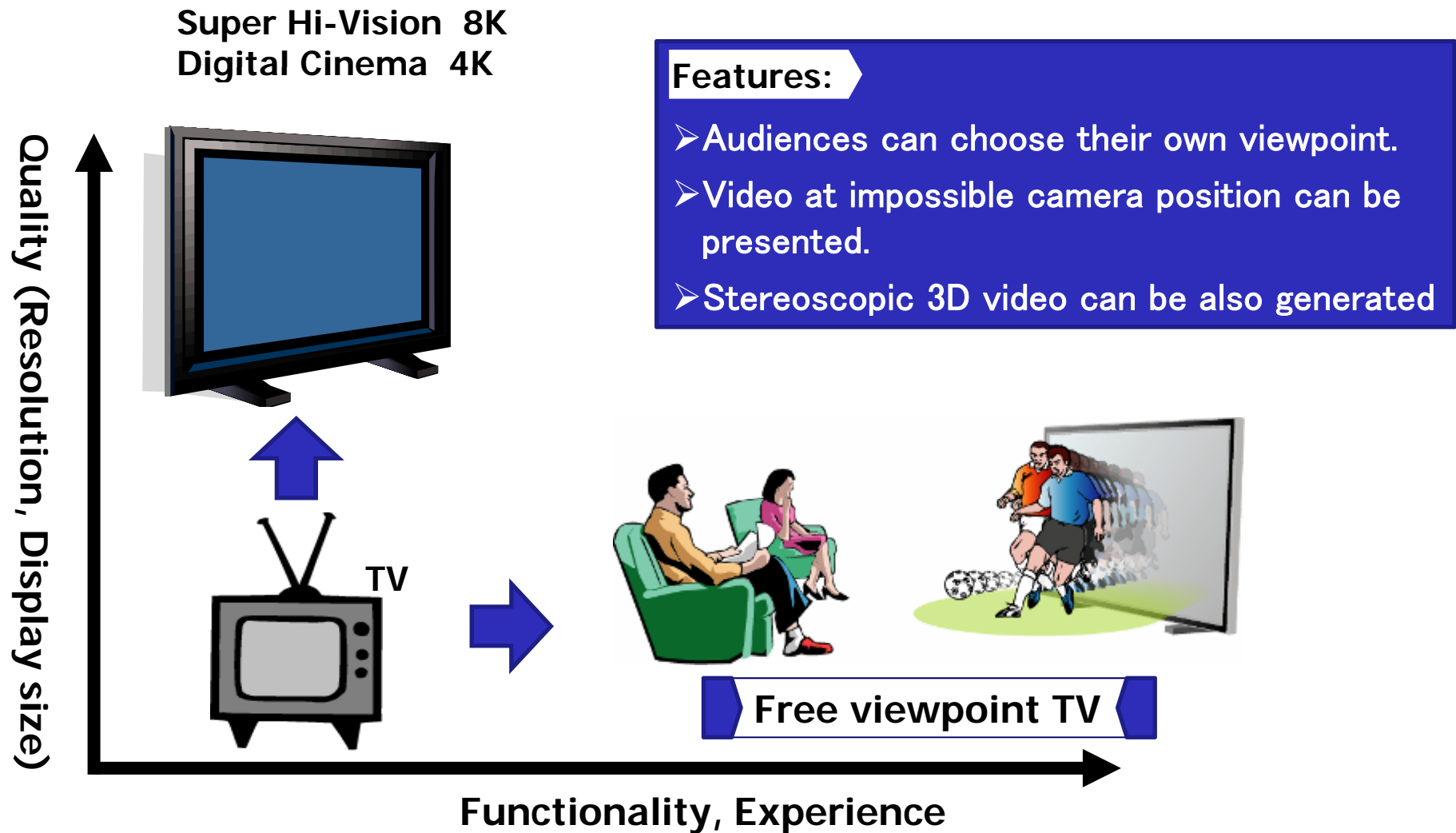Ultra realistic video production and delivering technology

(2) Security

Mobile security technology with lighter processing, high speed & performance

Related Research Activities in KDDI R&D Labs.

(1) Free Viewpoint TV
(2) Stream Cipher algorithm : KCipher-2

(1) Evolution toward Ultra Realistic TV

Super Hi-Vision 8K
Digital Cinema 4K

Quality (Resolution, Display size)

TV

Functionality, Experience

Features:

- Audiences can choose their own viewpoint.
- Video at impossible camera position can be presented.
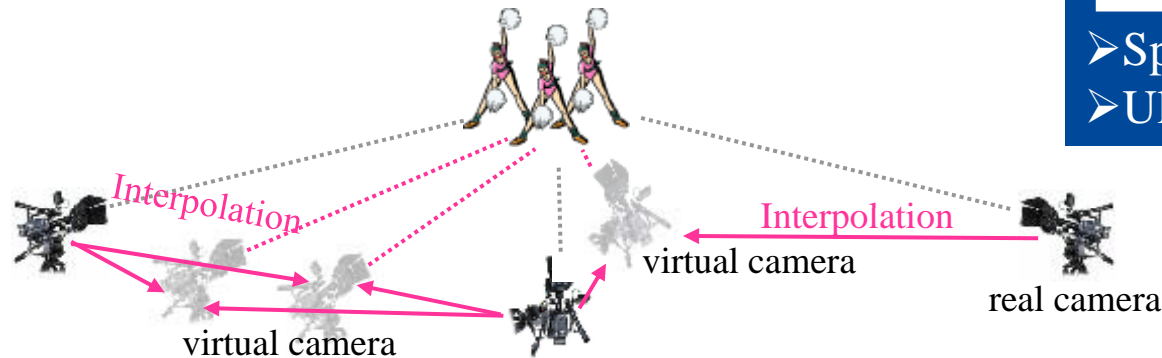- Stereoscopic 3D video can be also generated

Free viewpoint TV

(1) Generation of free viewpoint images

Interpolation is a key technology for "walk-through" view generation

> Special effect tool for video producer
> Ultra Realistic TV at home

Real camera and virtual camera

Virtual viewpoint #1

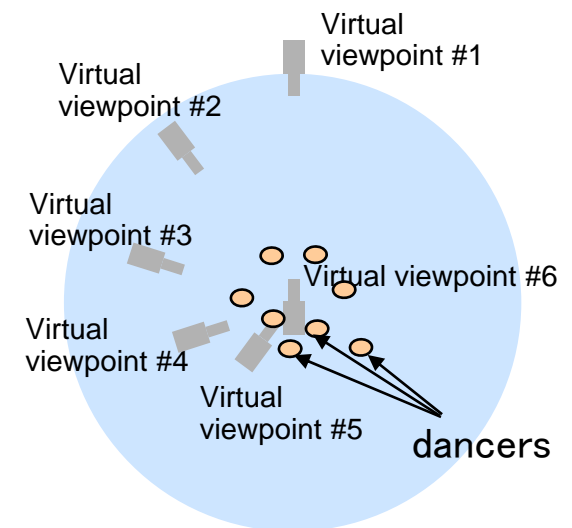Virtual viewpoint #2

Virtual viewpoint #3

Virtual viewpoint #4

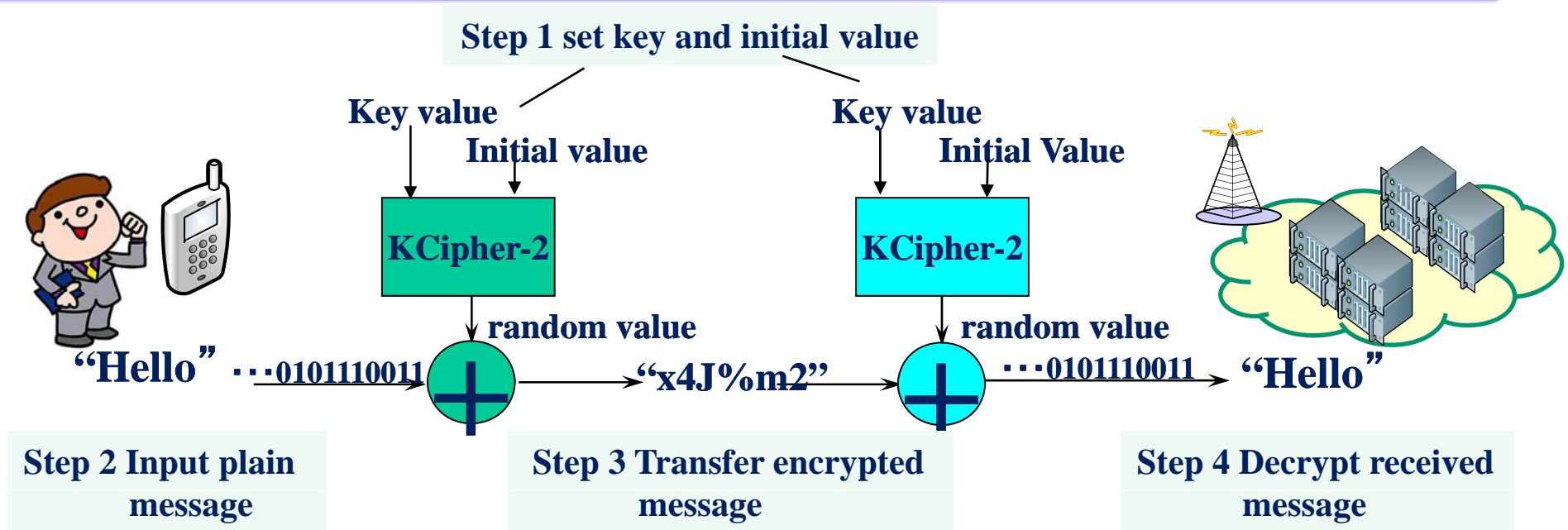Virtual viewpoint #5

Virtual viewpoint #6

Generated "walk-through" images

Top view of the stage

(2) Stream Cipher algorithm : KCipher-2

■ **Features of KCipher-2**

- ○ **High performance: it works 10 times faster than AES(De fact Standard)**
- ○ **Strong security: Evaluated by external research organizations**
- ○ **Draft International standard of ISO : CD 18033-4**
- ○ **Used for commercially released services**
  - ○ **Encryption for video streaming service**
  - ○ **Secure Mobile Solution for Government System**

Step 1 set key and initial value

Key value
Initial value

KCipher-2

random value

"Hello" ···0101110011 ⊕ "x4J%m2"

Step 2 Input plain message

Key value
Initial Value

KCipher-2

random value

···0101110011 "Hello"

Step 3 Transfer encrypted message

Step 4 Decrypt received message

example of secure mobile communication

Summary

KDDI would like to contribute for the research collaboration program between India and Japan for developing future ICT industry.

Expectations on the Collaboration Program
(1) Timely contribution to future ICT industries by matching abundant researchers resource in India with key elemental technologies in Japan

(2) Collaborative international standardization activity

(3) Researchers exchange program supported by governmental funding will effectively promote mutual researchers resource skill-up.

KDDI Business Portfolio

FMBC Services

Mobile Services Domain

Fixed Services Domain

UQ Communications

1Gbps Access : Giga-Toku

cdma 1X WIN
EV-DO Rev.A

au by KDDI

WiMAX

auひかり

FTTH
Triple-Play

Cellular Mobile

Mobile Internet

EZweb

KDDI メタルプラス

Fixed Telephony /
Metal Plus

Consumer Market

KDDI

Solutions Fixed / Mobile

Enterprise Market

au one NET

Internet ISP & Gateway

Intranet for Enterprise

ケーブルプラス 電話

Leased Circuits / FTTP

CATV JCN, J:COM

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