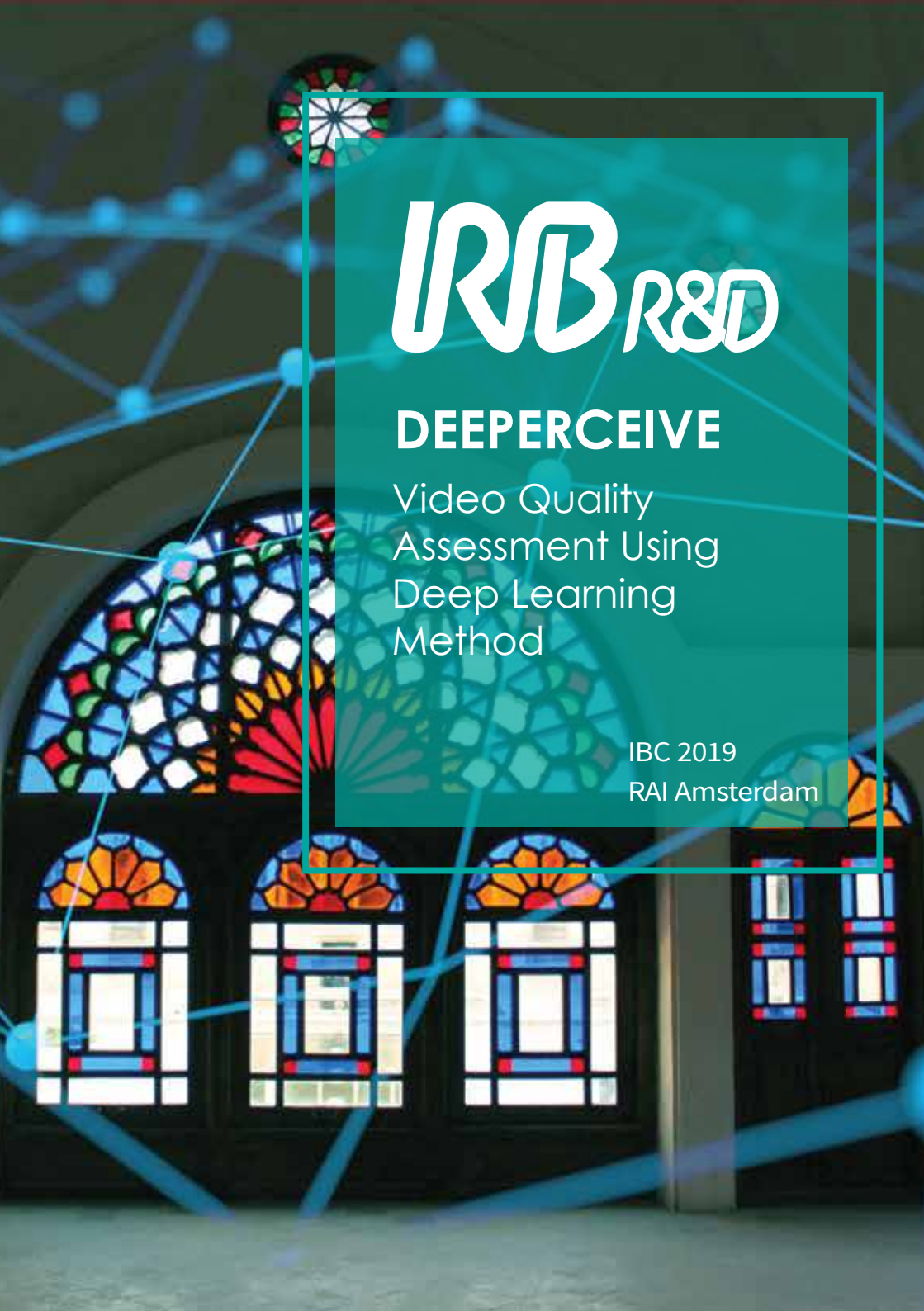
IRT R&D
DEEPERCEIVE
Video Quality Assessment Using Deep Learning Method
IBC 2019
RAI Amsterdam

Video Quality Assessment (VQA) using Deep Learning

The video quality depends on various features such as brightness, colorfulness, sharpness, noise level, etc. These features provide a quality measure; however, the perception of quality by human observers coincides with none of them. Indeed, the human perception of quality is a highly nonlinear and rather unknown function of all those features. For instance, there is no consensus whether sharpness outweighs colorfulness in determining a quality score. Besides, estimating the perceivable quality of a video data is an important issue for content providers at various stages of production to transmission. IRIB R&D is proud to announce a solution based on artificial intelligence which estimates the average perceived quality score of any video data which high precision. The method is trained on a large dataset of video files with various quality levels each accompanied with opinion scores of many human observers.

Applications

- Monitoring of broadcast chain
- Quality assessment for content providers
- Video ranking for search engines
- Sorting of similar contents for video on demand (VoD) services

Objective quality metrics

In addition to estimating the perceived mean opinion score (MOS), our solution measures a long list of conventional and tailored objective quality metrics to provide a comprehensive tool for video quality assessment. The list includes:

Video Features

- MOS
- Brightness
- Chroma
- Contrast
- Colorfulness
- Chroma imbalance
- Loss of Chroma
- Color gamut
- Photosensitive epilepsy risk
- Saturated red transition epilepsy risk
- Blockiness
- Frame luminance
- Frame freezing
- Scene change
- Letter boxing
- Pillar boxing
- Window boxing
- Black frame
- Frame drop
- Video information
- Blurriness
- Blooming
- Stripe noise
- Low luminance
- Noise estimation

Audio Features

- Audio clipping
- Mute detection
- Audio constant
- Noise detection
- Phase distortion
- Phase coherence
- Audio contrast
- THD+N
- Clicks and pops
- Loudness Momentary
- Loudness Short Term
- Loudness Integrated
- Loudness LRU
- Loudness true peak level
- Loudness Mismatch
- SINAD
- S/N SNR

Advantages

- Comprehensive list of quality features for audio and video
- Several operating modes:
- Offline mode for visualised quality details of a video file
- Real-time mode for instantaneous depiction of quality metrics of a stream
- Archive mode for producing quality log reports of a set of video files
- Compatibility with most video codec formats
- Detailed reports
- Real-time alarms for critical features
- Adjustable and customizable warning thresholds
- Inclusion of various report formats: XML, JSON, CSV, PDF

Islamic Republic of Iran Broadcasting (IRIB)
Research and Development

IRIB R&D has made major advances in applying basic research and innovation in media technology. It develops innovative new products and technologies in broadcast/broadband industry that leads the development of future technologies in IRIB. Our R&D projects often involve collaborations with public or private entities, including universities, government laboratories, technology start-ups and incubators, research institutes and partner companies.

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