Applied Research on Panoramic Aerial Photography in Emergency Event Reporting: Postprint

Authors: Wang Xi, Jin Xiangyun, Liu Yi

Date: 2023-10-08T00:00:00+00:00

Abstract

Advances in media technology have established the foundation for applying aerial photography—a new media technology—to news reporting. Breaking news represents the category with the most complex circumstances and the most stringent demands on media response time among all news types. This paper will examine aerial photography within the broad context of its application across multiple fields, summarize specific cases and experiences of news media employing panoramic aerial photography, the specific operational procedures of panoramic aerial photography formats, and the current dilemmas in its application, and explore novel reporting experiences and models for breaking news.

Full Text

Research on the Application of Panoramic Aerial Photography in Emergency Event Reporting

Authors: Wang Xi, Jin Xiangyun, Liu Yi

Abstract: Advances in media technology have laid the foundation for applying aerial photography—a new media technology—to news reporting. Breaking news represents the most complex category of journalism with the most demanding response time requirements. This study examines the broad context of aerial photography applications across multiple fields, summarizes specific cases and experiences of news media utilizing panoramic aerial photography, explores the concrete operational methods involved, and analyzes current dilemmas in its application, thereby investigating new reporting experiences and models for breaking news.

Keywords: panoramic; aerial photography; emergency events; application

With ongoing technological innovation and evolving photographic techniques, panoramic aerial photography (aerial imaging) has experienced explosive growth in recent years. Due to its unique shooting perspective and high-quality stable footage that clearly presents geographical formations, it has been widely applied in film and television, news, military affairs, urban planning, and numerous other fields. From initial platforms such as airplanes, helicopters, and hot air balloons to today's accessible and user-friendly drone-based aerial photography models, all have provided strong support for the further development of aerial imaging. On June 15, 2015, Xinhua News Agency's portal website Xinhuanet unveiled China's first news drone fleet to the public. More than a dozen overseas media outlets, including the Associated Press and CNN, have also intensified their efforts in drone news photography. These developments collectively signal that a transformative wave in news media is approaching, with drone aerial photography becoming the "new vogue."

2.1 Panoramic Aerial Photography Based on Drone-Mounted Gimbal Cameras

When discussing aerial photography, the focus lies on two aspects: "flying" and "shooting." "Flying" refers to the drone as an aircraft providing flight support, while in today's consumer-grade drones, most can carry gimbals and cameras—this constitutes the "shooting." Typically, to achieve panoramic aerial photography, the drone simply needs to hover stably at a relatively appropriate altitude above the emergency site. First, by maneuvering the drone's horizontal 360° rotation, and second, by controlling the onboard camera's vertical movement via the remote controller while calculating specific horizontal angles, continuous shots can be taken from upward, level, and downward angles. By combining these two operational methods, multiple static images can be captured and later stitched together through post-processing and uploaded to panoramic cloud platforms to present 360° panoramic aerial stills. Therefore, utilizing the drone's gimbal-mounted camera in conjunction with the drone's own propulsion represents one operational method for applying panoramic aerial photography to emergency event reporting.

1. Applications of Panoramic Aerial Photography in the News Field

As an emerging technology, panoramic aerial photography is bringing revolutionary changes to news reporting, presenting audiences with highly impactful and shocking visuals from a bird's-eye perspective. This is particularly valuable in breaking news coverage of natural disasters, accidents, and public security incidents, enabling audiences to intuitively experience on-site imagery. For instance, during the July 23, 2014, Penghu air disaster in Taiwan, CCTV employed drone footage in its live broadcast, multi-dimensionally showcasing the crash site from above. On July 31, 2014, when multiple streets in Kaohsiung, Taiwan, experienced flammable gas leaks followed by massive explosions, quadcopter aerial vehicles were deployed to capture footage shared by numerous media outlets.

Panoramic aerial photography has also provided comprehensive documentary coverage during the 2011 Occupy Wall Street protests, the 2011 Japan earthquake, the April 2013 Lushan 7.0-magnitude earthquake in Sichuan, the 2013 Typhoon Haiyan in the Philippines, the April 2015 Nepal 8.1-magnitude earthquake, and numerous other emergency events.

2. Operational Procedures for Panoramic Aerial Photography Application

The year 2016 marked a "blowout" growth period for consumer-grade drones. Compared with industrial drones, consumer drones offer advantages in portability, ease of operation, and flexibility, often becoming the preferred tool for journalists facing breaking news. Regarding operational procedures, there are two primary methods.

The first method involves using a drone-mounted gimbal camera as described above. The second, more streamlined approach involves mounting a dedicated panoramic camera onto the drone. Since panoramic cameras are now widely used in panoramic and VR (virtual reality) filming practices, directly mounting a panoramic camera onto a drone via secure fixtures enables direct capture of dynamic panoramic video and static panoramic images, which can then be processed and edited in post-production. However, two issues warrant attention: first, consumer drones' biggest limitations are insufficient payload capacity and battery life—adding a panoramic camera increases payload and inevitably reduces flight time, so attention must be paid to power redundancy. Second, since the mounted panoramic camera can shoot directly with minimal manipulation of the gimbal or camera, selecting appropriate flight routes requires careful consideration before takeoff. By choosing suitable flight paths, the visual language of panoramic video can be enriched.

Funding: This research is supported by the 2016 "Seed Program" for College Student Innovation and Entrepreneurship at the College of Communication Science and Art, Chengdu University of Technology (Project No. CYYY20161108).

3. Domestic Media Application of Panoramic Aerial Photography in Emergency Events

At approximately 11:30 PM on August 12, 2015, a fire and explosion occurred at Ruihai Company's hazardous materials warehouse in Tianjin Port's Binhai New Area. After a large-scale fire, two explosions followed: the first with a local magnitude of about 2.3, equivalent to three tons of TNT, and a second, more violent explosion with a magnitude of about 2.9, equivalent to 21 tons of TNT. The situation at the scene was extremely critical, posing an urgent challenge for news material collection.

When audiences sought to understand this event, beyond caring about relevant data and background connections, they urgently desired to comprehend the on-site situation through audiovisual language. In covering this "8 • 12" Tianjin

Port catastrophe, drone panoramic aerial equipment became the tool of choice for journalists. Chen Jie, a reporter from *The Beijing News*, won the 2016 World Press Photo award for aerial news photographs captured by drone. The drone panoramic aerial equipment provided audiences with precise visual documentation from above Tianjin Port. On the day of the incident, the equipment also enabled live broadcasting, delivering firsthand information to audiences while providing accurate and reliable intelligence for rescue workers on the ground. The captured footage showed thick smoke, a devastated dock, and large quantities of containers burning in raging flames—all news material seized by drone panoramic aerial photography. In subsequent follow-up reports, such as the feature "Aerial Comparison Photos of Tianjin Port Before and After the August 12 Explosion," the high-definition images presented to audiences were all captured through panoramic aerial photography.

Evidently, panoramic aerial photography has become the preferred and mainstream choice for breaking news coverage. It not only replaces human effort and overcomes environmental limitations and obstacles to improve news collection quality and efficiency, but also employs entirely new perspectives to diversify news content presentation. It extends news coverage to spaces inaccessible to ordinary people, excelling at gathering news material in "3D environments" (Dull, Dirty, Dangerous).

4. Dilemmas in Applying Panoramic Aerial Photography to Emergency Reporting

First, application scenarios involve complex environments. When emergencies occur, news scenes are often fraught with complexity and uncertainty. Natural disasters such as earthquakes, landslides, fires, and floods create environments that are not only unfavorable and obstructive for filming but also pose certain dangers to journalists themselves. For example, during the August 2015 Tianjin Binhai New Area explosion, large-scale chemical leaks prevented ground rescue personnel and firefighters from approaching, and lighting conditions were extremely poor. Even from an aerial perspective, panoramic aerial photography struggled to comprehensively capture and record the immediate scene. Thus, emergency events constrain aerial photography through environmental limitations.

Second, flight approval procedures are cumbersome. Currently, China has yet to establish relatively clear regulations specifically for drone flights. Strictly speaking, drone operations require advance application to relevant authorities and agencies, including public security, air force, and civil aviation departments, and can only proceed after approval. However, the time-sensitive nature of breaking news demands that journalists make immediate decisions to launch and capture footage to ensure timeliness. The cumbersome and ambiguous nature of current flight approval procedures places journalists in a dilemma between "illegal flight" and "scooping the news," creating numerous contradictions. Therefore, the state must formulate relatively standardized management measures for civil-

ian drones, which would also facilitate timely information delivery to audiences when applying panoramic aerial photography to emergency reporting.

Finally, there is a shortage of media professionals mastering panoramic aerial photography technology. Currently, both traditional and new media have a considerable number of journalists accustomed to "old media" reporting methods centered on text, audio, and ground photography. Moreover, operating consumer drones for filming requires mastery of certain theoretical knowledge and practical experience, while media organizations' emphasis on new media technology and availability of practical training platforms also significantly impact skill development. Consequently, in today's converged media era, "all-around journalists" capable of presenting emergency news scenes from multiple perspectives using "new media" such as aerial photography are extremely scarce, and the proportion of journalists possessing these abilities within the overall journalist workforce remains low.

5. Conclusion

Currently, although panoramic aerial photography has begun to "show its edge" in news reporting, particularly in some emergency events, and has achieved notable communication effects, it cannot be ignored that integrating panoramic aerial photography technology into routine daily news reporting remains a long journey with many challenges ahead. Therefore, as news media organizations explore panoramic aerial photography in practice, they should not limit themselves to emergency events alone but should further summarize which news genres or types are suitable for panoramic aerial photography to enhance application capabilities and facilitate exploration of new paths for media convergence.

References: [1] Wang Jianhua. "Eye in the Sky, Photography Upgraded—Xinhua News Agency's 'Eye in the Sky' Drone Team's Practice and Reflection on News Photography." *Chinese Journalist*, 2017(01). [2] Zhou Huifeng. "Analysis of Drone Aerial Photography Technology Application in Daily News Reporting." *Radio & TV Broadcast Technology*, 2014(06). [3] Xu Zhiqiang. "Vision for a Media Drone Emergency Reporting Platform in the All-Media Environment." *Video Engineering*, 2015.

Author Biographies: Wang Xi, male, from Dazhou, Sichuan, is currently a master's student in Communication Studies at the College of Communication Science and Art, Chengdu University of Technology. Research focus: audiovisual art communication.

Jin Xiangyun is an undergraduate student in Radio and Television Studies at the College of Communication Science and Art, Chengdu University of Technology.

Liu Yi is a National First-Class Director, currently serving as Dean and Master's Supervisor at the College of Communication Science and Art, Chengdu University of Technology, and as a professional academic leader.

(Author Affiliation: Chengdu University of Technology)