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Document Analysis Systems

14th IAPR International Workshop, DAS 2020 Wuhan, China, July 26–29, 2020 Proceedings



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Preface

Welcome to the 14th IAPR International Workshop on Document Analysis Systems (DAS 2020). For the first time in our long history, DAS was held virtually. The workshop was originally set to take place in Wuhan, China, in May 2020. However, given the worldwide pandemic, we decided to host DAS during July 26–29, 2020, and converted the workshop into a fully virtual event.

As a result, instead of welcoming you to Wuhan, we brought Wuhan to you. While the organization of DAS 2020 was still based in Wuhan, the workshop was not confined to a specific location. In a sense, this was the first truly worldwide edition of DAS, taking place around the world in a coordinated fashion, employing a schedule we designed to support participation across a wide range of time zones. Of course, this comes with some challenges, but also with interesting opportunities that caused us to rethink how to foster social and scientific interaction in this new medium. It also allowed us to organize an environmentally friendly event, to extend the reach of the workshop, and to facilitate participation literally from anywhere to those with an interest in our field and an internet connection. We truly hope we managed to make the most out of a difficult situation.

DAS 2020 continued the long tradition of bringing together researchers, academics, and practitioners from all over the world in the research field of Document Analysis Systems. In doing so, we build on the previous workshops held over the years in Kaiserslautern, Germany (1994); Malvern, PA, USA (1996); Nagano, Japan (1998); Rio de Janeiro, Brazil (2000); Princeton, NJ, USA (2002); Florence, Italy (2004); Nelson, New Zealand (2006); Nara, Japan (2008); Boston, MA, USA (2010); Gold Coast, Australia (2012); Loire Valley Tours, France (2014); Santorini, Greece (2016); and Wien, Austria (2018).

As with previous editions, DAS 2020 was a rigorously peer reviewed and 100% participation single-track workshop focusing on system-level issues and approaches in document analysis and recognition. The workshop comprises presentations by invited speakers, oral and poster sessions, a pre-workshop tutorial, as well as the distinctive DAS discussion groups.

We received 64 submissions in total, 57 of which in the regular paper track and 7 in the short paper track. All regular paper submissions underwent a rigorous single-blind review process where the vast majority of papers received three reviews from the 62 members of the Program Committee, judging the originality of work, the relevance to document analysis systems, the quality of the research or analysis, and the presentation. Of the 57 regular submissions received, 40 were accepted for presentation at the workshop (70%). Of these, 24 papers were designated for oral presentation (42%) and 22 for poster presentation (38%). All short paper submissions were reviewed by at least two of the program co-chairs. Of the 7 short papers received, 6 were accepted for poster presentation at the workshop (85%). The accepted regular papers are published in this

proceedings volume in the *Springer Lecture Notes in Computer Science* series. Short papers appear in PDF form on the DAS workshop website.

The final program includes six oral sessions, two poster sessions, and the discussion group sessions. There were also two awards announced at the conclusion of the workshop: the IAPR Best Student Paper Award and IAPR Nakano Best Paper Award. We offer our deepest thanks to all who contributed their time and effort to make DAS 2020 a first-rate event for the community.

In addition to the contributed papers, the program included three invited keynote presentations by distinguished members of the research community: Tong Sun, who leads the Document Intelligence Lab in Adobe, spoke about "The Future of Document: A New Frontier in the New Decade;" Lianwen Jin, from South China University of Technology, spoke on the topic of "Optical Character Recognition in the Deep Learning Era;" and C.V. Jawahar, from IIIT Hyderabad, shared his vision about "Document Understanding Beyond Text Recognition."

We furthermore would like to express our sincere thanks to the tutorial organizers, Zhibo Yang and Qi Zheng from Alibaba, for sharing their valuable scientific and technological insights. A special thanks is also due to our sponsors IAPR, Meituan, Hanvon Technology, Huawei Technologies, and TAL Education Group, whose support, especially during challenging times, was integral to the success of DAS 2020.

The workshop program represents the efforts of many people. We want to express our gratitude especially to the members of the Program Committee and the external reviewers for their hard work in reviewing submissions. The publicity chairs Koichi Kise (Japan), Simone Marinai (Italy), and Mohamed Cheriet (Canada) helped us in many ways, for which we are grateful. We also thank the discussion group chairs Alicia Fornés (Spain), Faisal Shafait (Germany), and Vincent Poulain d'Andecy (France) for organizing the discussion groups, and the tutorial chairs Jun Sun (China), Apostolos Antonacopoulos (UK), and Venu Govindaraju (USA) for organizing the tutorials. A special thank goes to the publication chair Yongchao Xu (China), who was responsible for the proceedings at hand. We are also grateful to the local arrangements chairs who made great efforts in arranging the program, maintaining the Webpage, and setting up the virtual meeting platform. The workshop would not have happened without the great support from the hosting organization, Huazhong University of Science and Technology.

Finally, the workshop would not be possible without the excellent papers contributed by authors. We thank all the authors for their contributions and their participation in DAS 2020! We hope that this program will further stimulate research and provide practitioners with better techniques, algorithms, and tools for the deployment. We feel honored and privileged to share the best recent developments in the field of Document Analysis Systems with you in these proceedings.

July 2020

Cheng-Lin Liu Shijian Lu Jean-Marc Ogier Xiang Bai Dimosthenis Karatzas Daniel Lopresti

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