Report on CLEF 2020

Avi Arampatzis
Democritus University of Thrace, Greece
avi@ee.duth.gr

Linda Cappellato
University of Padua, Italy
cappellato@dei.unipd.it

Carsten Eickhoff
Brown University, USA
carsten@brown.edu

Nicola Ferro
University of Padua, Italy
ferro@dei.unipd.it

Hideo Joho
University of Tsukuba, Japan
hideo@slis.tsukuba.ac.jp

Evangelos Kanoulas
University of Amsterdam, The Netherlands
e.kanoulas@uva.nl

Christina Lioma
University of Copenhagen, Denmark
c.lioma@di.ku.dk

Aurélie Névéol
LIMSI, CNRS, France
neveol@limsi.fr

Theodora Tsikrika
Information Technologies Institute, CERTH, Greece
theodora.tsikrika@iti.gr

Stefanos Vrochidis
Information Technologies Institute, CERTH, Greece
stefanos@iti.gr

Abstract

This is a report on the tenth edition of the *Conference and Labs of the Evaluation Forum* (CLEF 2020), (virtually) held from September 22–25, 2020, in Thessaloniki, Greece.

CLEF was a four day event combining a Conference and an Evaluation Forum. The Conference featured keynotes by Ellen Voorhees and Yiannis Kompasiaris, and presentation of

peer reviewed research papers covering a wide range of topics in addition to many posters. The Evaluation Forum consisted to twelve Labs: ARQMath, BioASQ, CheckThat!, ChEMU, CLEF eHealth, eRisk, HIPE, ImageCLEF, LifeCLEF, LiLAS, PAN, and Touché, addressing a wide range of tasks, media, languages, and ways to go beyond standard test collections.

1 Introduction

The 2020 edition of the *Conference and Labs of the Evaluation Forum*[1] (CLEF) was jointly organized by the Center for Research and Technology Hellas (CERTH), the University of Amsterdam, and the Democritus University of Thrace, and it was expected to be hosted by CERTH, and in particular by the Multimedia Knowledge and Social Media Analytics Laboratory of its Information Technologies Institute, at the premises of CERTH, in Thessaloniki, Greece from 22$^{\text{th}}$ to 25$^{\text{th}}$ September 2020.

The outbreak of the Covid-19 pandemic in early 2020 affected the organization of CLEF 2020. The CLEF steering committee along with the organizers of CLEF 2020, after detailed discussions, decided to run the conference fully virtually. The conference format remained the same as in past years, and consisted of keynotes, contributed papers, lab sessions, and poster sessions, including reports from other benchmarking initiatives from around the world. All sessions were organized and run online.

CLEF was established in 2000 as a spin-off of the TREC Cross-Language Track with a focus on stimulating research and innovation in multimodal and multilingual information access and retrieval [1, 2]. Over the years, CLEF has fostered the creation of language resources in many European and non-European languages, promoted the growth of a vibrant and multidisciplinary research community, provided sizable improvements in the performance of monolingual, bilingual, and multilingual information access systems [3], and achieved a substantial scholarly impact [4, 5, 6].

In its first 10 years, CLEF hosted a series of experimental labs that reported their results at an annual workshop held in conjunction with the European Conference on Digital Libraries (ECDL). In 2010, now a mature and well-respected evaluation forum, CLEF expanded to include a complementary peer-reviewed conference for discussion of advancing evaluation methodologies and reporting the evaluation of information access and retrieval systems regardless of data type, format, language, etc. Moreover, the scope of the evaluation labs was broadened, to comprise not only multilinguality but also multimodality in information access. Multimodality here is intended not only as the ability to deal with information coming in multiple media but also in different modalities, e.g. the Web, social media, news streams, specific domains and so on. Since 2010, the CLEF conference has established a format with keynotes, contributed papers, lab sessions, and poster sessions, including reports from other benchmarking initiatives from around the world. Since 2013, CLEF has been supported by an association, a lightweight not-for-profit legal entity that thanks to the financial support of the CLEF community takes care of the small central coordination needed to operate CLEF on an ongoing basis and makes it a self-sustaining activity [1].

CLEF 2020 continued the initiative introduced in the 2019 edition during which, the *European*

[1] http://clef2020.clef-initiative.eu/

Conference for Information Retrieval (ECIR) and CLEF joined forces: ECIR 2020 hosted a special session dedicated to CLEF Labs where lab organizers present the major outcomes of their Labs and their plans for ongoing activities, followed by a poster session to favour discussion during the conference. This was reflected in the ECIR 2020 proceedings, where CLEF Lab activities and results were reported as short papers. The goal was not only to engage the ECIR community in CLEF activities but also to disseminate the research results achieved during CLEF evaluation cycles as submission of papers to ECIR.

CLEF 2020 ran as an online, free of charge event, thanks to the BCS-IRSG and the ACM-SIGIR Friends sponsorship. This gave the opportunity to researchers around the globe for remote participation. In total, 673 individuals registered to attend the conference, with approximately 11.4% coming from Asia, 21.5% coming from the Americas, and 67.1% from Europe and Africa (only the timezone of participants was known to the organizers). The online program was run using Zoom Webinar for the plenary sessions, and Zoom Meetings for the Lab sessions. The number of attendees per plenary was approximately 80 individuals, while the number of attendees for the lab sessions varied. The organizers scheduled all Zoom sessions ahead of time, assigning different coordinators to the different sessions. Unfortunately, it was not possible to organize social activities (random encounters, social events, etc.), mainly due to limited solutions available. Several options however have sprung during the recent months that future online editions of conferences could adopt.

2 The CLEF Conference

CLEF 2020 continued the focus of the CLEF conference on "experimental IR", as carried out at evaluation forums (CLEF Labs, TREC, NTCIR, FIRE, MediaEval, RomIP, TAC, etc.), with special attention to the challenges of multimodality, multilinguality, and interactive search. We invited submissions on significant new insights demonstrated on the resulting IR test collections, on analysis of IR test collections and evaluation measures, as well as on concrete proposals to push the boundaries of the Cranfield/TREC/CLEF paradigm [7].

Keynotes The following scholars were invited to give a keynote talk at the CLEF 2020 conference.

Ellen Voorhees (NIST, USA) delivered a talk entitled "Building Reusable Test Collections" which focused on reviewing various approaches for building fair, reusable test collections with large documents sets.

Yiannis Kompasiaris (CERTH-ITI, Greece) gave a speech on "Social media mining for sensing and responding to real-world trends and events", presenting the unique opportunity social media offer to discover, collect, and extract relevant information that provides useful insights in areas ranging from news to environmental and security topics, while addressing key challenges and issues, such as fighting misinformation and analysing multimodal and multilingual information.

Other Evaluation Initiatives *Ellen Voorhees* (NIST, USA) briefly introduced TREC[2] (Text REtrieval Conference) of which the purpose is to support research within the information retrieval

[2] https://trec.nist.gov/

community by providing the infrastructure necessary for large-scale evaluation of text retrieval methodologies. Then, she presented in detail the recent TREC-COVID[3] initiative whose goals are: (i) to evaluate search algorithms and systems for helping scientists, clinicians, policy makers, and others manage the existing and rapidly growing corpus of scientific literature related to COVID-19, and (ii) to discover methods that will assist with managing scientific information in future global biomedical crises. *Makoto P. Kato* (University of Tsukuba, Japan) presented NTCIR[4] (NII Testbeds and Community for Information access Research), which promotes research in information access technologies with a special focus on East Asian languages and English. *Prasenjit Majumder* (DA-IICT, India) introduced FIRE[5], which fosters the development of multilingual information access systems for the Indian sub-continent and explores new domains like plagiarism detection, legal information access, mixed script information retrieval and spoken document retrieval. Finally, *Gareth Jones* (Dublin City University, Ireland) presented MediaEval[6], the benchmarking initiative for multimedia evaluation, including speech, audio, visual content, tags, users, and context.

Technical Program CLEF 2020 received a total of nine submissions, of which a total of seven papers (five long, two short) were accepted. Each submission was reviewed by three program committee members, and the program chairs oversaw the reviewing and follow-up discussions. Seven countries are represented in the accepted papers where many of them were a product of international collaboration. This year, researchers addressed the following important challenges in the community: a large-scale evaluation of translation effects in academic search, advancement of assessor-driven aggregation methods for efficient relevance assessments, development of a new test collection or dataset for 1) missing data detection methods in knowledge-base, 2) Russian reading comprehension and 3) under-resourced languages such as Amharic (Ethiopia), revisiting the concept of session boundaries with fresh eyes, and development of argumentative document retrieval methods.

Like in previous editions since 2015, CLEF 2020 continued inviting CLEF lab organizers to nominate a "best of the labs" paper that was reviewed as a full paper submission to the CLEF 2020 conference according to the same review criteria and PC. Seven full papers were accepted for this section.

3 The CLEF Lab Sessions

Fifteen lab proposals were received and evaluated in peer review based on their innovation potential and the quality of the resources created. To identify the best proposals, well-established criteria from previous editions of CLEF were applied like, for example, topical relevance, novelty, potential impact on future world affairs, likely number of participants, and the quality of the organizing consortium. This year we further stressed the connection to real-life usage scenarios and we tried to avoid as much as possible overlaps among labs in order to promote synergies and integration.

[3] https://ir.nist.gov/covidSubmit/
[4] http://research.nii.ac.jp/ntcir/
[5] http://fire.irsi.res.in/
[6] http://multimediaeval.org/

The 12 selected labs represented scientific challenges based on new data sets and real world problems in multimodal and multilingual information access. These data sets provide unique opportunities for scientists to explore collections, develop solutions for these problems, receive feedback on the performance of their solutions, and discuss the issues with peers at the workshops.

The 12 labs running as part of CLEF 2020 comprised new labs (ARQMath, CheMU, HIPE, LiLAS and Touché) as well as seasoned labs that offered previous editions at CLEF (CheckThat!, CLEF eHealth, eRisk, ImageCLEF, LifeCLEF and PAN) or in other platforms (BioASQ). Details of the individual labs are described by the lab organizers in the CLEF Working Notes [8]. We only provide a brief overview of them here.

ARQMath: Answer Retrieval for Mathematical Questions[7] considers the problem of finding answers to new mathematical questions among posted answers on the community question answering site *Math Stack Exchange*. The goals of the lab are to develop methods for mathematical information retrieval based on both text and formula analysis [9].

BioASQ[8] challenges researchers with large-scale biomedical semantic indexing and question answering (QA). The challenges include tasks relevant to hierarchical text classification, machine learning, information retrieval, QA from texts and structured data, multi-document summarization and many other areas. The aim of the BioASQ workshop is to push the research frontier towards systems that use the diverse and voluminous information available online to respond directly to the information needs of biomedical scientists [10].

CheckThat!: Identification and Verification of Political Claims[9] aims to foster the development of technology capable of both spotting and verifying check-worthy claims in political debates in English, Arabic and Italian. The concrete tasks were to assess the check-worthiness of a claim in a tweet, check if a (similar) claim has been previously verified, retrieve evidence to fact-check a claim, and verify the factuality of a claim [11].

ChEMU: Information Extraction from Chemical Patents[10] proposes two key information extraction tasks over chemical reactions from patents. Task 1 aims to identify chemical compounds and their specific types, i.e. to assign the label of a chemical compound according to the role which it plays within a chemical reaction. Task 2 requires identification of event trigger words (e.g. "added" and "stirred") which all have the same type of "EVENT_TRIGGER", and then determination of the chemical entity arguments of these events [12].

CLEF eHealth[11] aims to support the development of techniques to aid laypeople, clinicians and policy-makers in easily retrieving and making sense of medical content to support their decision making. The goals of the lab are to develop processing methods and resources in a multilingual setting to enrich difficult-to-understand eHealth texts and provide valuable documentation [13].

[7] https://www.cs.rit.edu/~dprl/ARQMath/
[8] http://www.bioasq.org/workshop2020
[9] https://sites.google.com/view/clef2020-checkthat
[10] http://chemu.eng.unimelb.edu.au/
[11] http://clef-ehealth.org/

eRisk: Early Risk Prediction on the Internet[12] explores challenges of evaluation methodology, effectiveness metrics and other processes related to early risk detection. Early detection technologies can be employed in different areas, particularly those related to health and safety. The 2020 edition of the lab focused on texts written in social media for the early detection of signs of self-harm and depression [14].

HIPE: Named Entity Processing on Historical Newspapers[13] aims at fostering named entity recognition on heterogeneous, historical and noisy inputs. The goals of the lab are to strengthen the robustness of existing approaches on non-standard input; to enable performance comparison of named entity processing on historical texts; and, in the long run, to foster efficient semantic indexing of historical documents in order to support scholarship on digital cultural heritage collections [15].

ImageCLEF: Multimedia Retrieval[14] provides an evaluation forum for visual media analysis, indexing, classification/learning, and retrieval in medical, nature, security and lifelogging applications with a focus on multimodal data, so data from a variety of sources and media [16].

LifeCLEF: Biodiversity Identification and Prediction[15] aims at boosting research on the identification and prediction of living organisms in order to solve the taxonomic gap and improve our knowledge of biodiversity. Through its biodiversity informatics related challenges, LifeCLEF is intended to push the boundaries of the state-of-the-art in several research directions at the frontier of multimedia information retrieval, machine learning and knowledge engineering [17].

LiLAS: Living Labs for Academic Search[16] aims to bring together researchers interested in the online evaluation of academic search systems. The long term goal is to foster knowledge on improving the search for academic resources like literature, research data, and the interlinking between these resources in fields from the Life Sciences and the Social Sciences. The immediate goal of this lab is to develop ideas, best practices, and guidelines for a full online evaluation campaign at CLEF 2021 [18].

PAN: Digital Text Forensics and Stylometry[17] is a networking initiative for the digital text forensics, where researchers and practitioners study technologies that analyze texts with regard to originality, authorship, and trustworthiness. PAN provides evaluation resources consisting of large-scale corpora, performance measures, and web services that allow for meaningful evaluations. The main goal is to provide for sustainable and reproducible evaluations, to get a clear view of the capabilities of state-of-the-art-algorithms [19].

[12] http://erisk.irlab.org/
[13] https://impresso.github.io/CLEF-HIPE-2020/
[14] https://www.imageclef.org/2019
[15] http://www.lifeclef.org/
[16] https://clef-lilas.github.io/
[17] http://pan.webis.de/

Touché: Argument retrieval[18] is the first shared task on the topic of argument retrieval. Decision making processes, be it at the societal or at the personal level, eventually come to a point where one side will challenge the other with a why-question, which is a prompt to justify one's stance. Thus, technologies for argument mining and argumentation processing are maturing at a rapid pace, giving rise for the first time to argument retrieval [20].

As a group, the 71 lab organizers were based in 14 countries, with Germany, and France leading the distribution. Despite CLEF's traditionally Europe-based audience, 18 (25.4%) organizers were affiliated with international institutions outside of Europe. The gender distribution was biased towards 81.3% male organizers.

More information on the CLEF 2020 conference, the CLEF initiative and the CLEF Association is provided on the Web:

- CLEF 2020: http://clef2020.clef-initiative.eu/
- CLEF initiative: http://www.clef-initiative.eu/
- CLEF Association: http://www.clef-initiative.eu/association

4 CLEF 2021 and Beyond

CLEF 2021 will be hosted by the University "Politehnica" of Bucharest, Romania, 21-24 September 2021.

More information on CLEF 2020, the call for papers and the ongoing labs are available at:

- http://clef2021.clef-initiative.eu/

As far as labs are concerned, CLEF 2021 will run 12 evaluation activities out of 15 proposals received: 11 will be a continuation of the labs running during CLEF 2020 and 1 will be a new pilot lab.

The continued activities are:

- ARQMath: Answer Retrieval for Questions on Math (https://www.cs.rit.edu/~dprl/ARQMath/);
- BioASQ: Large-scale Biomedical Semantic Indexing and Question Answering (http://www.bioasq.org/workshop2021);
- CheckThat! Lab on Detecting Check-Worthy Claims, Previously Fact-Checked Claims, and Fake News (https://sites.google.com/view/clef2021-checkthat);
- ChEMU: Cheminformatics Elsevier Melbourne University lab (http://chemu.eng.unimelb.edu.au/);
- CLEF eHealth: Retrieving and Making Sense of Medical Content (https://clefehealth.imag.fr/);

[18] https://events.webis.de/touche-20/

- eRisk: Early Risk Prediction on the Internet (http://early.irlab.org/);
- ImageCLEF: Multimedia Retrieval Challenge in CLEF (https://www.imageclef.org/2021);
- LifeCLEF: Multimedia Life Species Identification (https://www.imageclef.org/LifeCLEF2021);
- LiLAS: Living Labs for Academic Search (https://clef-lilas.github.io);
- PAN: Lab on Digital Text Forensics and Stylometry (https://pan.webis.de/).
- Touché: Argument Retrieval (http://touche.webis.de/).

The new activity is:

- SimpleText-2021: (Re)Telling Right Scientific Stories to Non-specialists via Text Simplification (https://www.irit.fr/simpleText/).

CLEF 2022 will be hosted by University of Bologna, Italy, in early September 2022.

CLEF 2023 will be hosted by CERTH-ITI, Greece, in early September 2023.

Finally, bids for hosting CLEF 2024 are now open and will close around July 2021. Proposals can be sent to the CLEF Steering Committee Chair at chair@clef-initiative.eu.

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[19] http://www.clef-initiative.eu/association
[20] http://sigir.org/
[21] https://irsg.bcs.org/

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