Preface - SMART 2022

SMART 2022 was the third edition of SMART, the subtasks for Question Answering over Knowledge Graph, which is part of the ISWC 2022 Semantic Web Challenge. It was co-located with the 21st International Semantic Web Conference (ISWC 2022)[1]. The first edition SMART2020 [1] was in ISWC 2020 and the second edition SMART2020 [2]. Given a question in natural language, the task of the SMART challenge is, to predict the answer type, entities and relations using a target ontology. In the current (third) edition, the SMART challenge had three tracks i.e. answer type prediction, entity linking and relation prediction. These three tasks are based on two popular KBs, one using the DBpedia ontology and the other using Wikidata. This volume contains peer-reviewed system description papers of all the systems that participated in the challenge. More details about the challenge can be found at `https://smart-task.github.io/2022/`.

Program and Keynote

This year's edition had two talks and one keynote. First Philipp Christmann spoke on behalf of his co-authors Rishiraj Saha Roy, Gerhard Weikum about 'Entity and Relation Linking using CLOCQ' Second the paper 'Contribution to SMART task 2022: Answer Type Prediction, Relation Linking and Entity Linking' by Azanzi Jiomekong, Vadel Tsague, Brice Foko, Uriel Melie, Gaoussou Camara was presented.

SMART also invited Dennis Diefenbach to give a keynote. He is the CEO of The QA Company. Dennis holds a Ph.D. from the University of Lyon. He talked about the 'Challenges of Domain Specific Question Answering Systems'.

We would like to thank all presenters again.

Challenge Description

This challenge is focused on answer type prediction, entity linking and relation prediction, which play an important role in KGQA (Question Answering over Knowledge Graphs) systems.

Answer Type Prediction Given a natural language question, the task is to produce a ranked list of answer types of a given target ontology. Previous such answer type classifications in literature are performed as a short-text classification task using a set of coarse-grained types, for instance, either six types [3, 4, 5, 6] or 50 types [7] with TREC QA task[2]. We propose a more granular answer type classification using popular Semantic Web ontologies such as *DBpedia* and *Wikidata*.

[1] `https://iswc2022.semanticweb.org/`
[2] `https://trec.nist.gov/data/qamain.html`

Relation Prediction Given a natural language question, the task is to identify the relation and link to the relations in KG. Depending on the number of relations in the KG, the number of relation types to be linked varies.

Entity Linking Given a natural language question, the task is to identify the entity mentions and link to the entities in KG.

Table 1, Table 2 and Table 3 illustrate some examples. The participating systems can be either supervised (training data is provided) or unsupervised. The systems can utilize a wide range of approaches; from rule-based to neural approaches.

Table 1: Example questions and answer types.

Question	**Answer Type**	
	DBpedia	**Wikidata**
Give me all actors starring in movies directed by and starring William Shatner.	dbo:Actor	wd:Q33999
Which programming languages were influenced by Perl?	dbo:ProgrammingLanguage	wd:Q9143
Who is the heaviest player of the Chicago Bulls?	dbo:BasketballPlayer	wd:Q3665646
How many employees does Google have?	xsd:integer	xsd:integer

Table 2: Example questions and relation types.

Question	**Relation Type**	
	DBpedia	**Wikidata**
Which languages were influenced by Perl?	dbo:influencedBy	wdt:P737
Give me all actors starring in movies directed by and starring William Shatner.	dbo:starring, dbo:director	wdt:P161, wdt:P57
How many employees does IBM have?	dbo:numberOfEmployees	wdt:P1128

Organisation

In this section, we list the people who organised and contributed to the success of this event.

Table 3: Example questions and entity linking.

Question	**Entity Linking**	
	DBpedia	**Wikidata**
Which languages were influenced by Perl?	dbr:Perl	wd:Q42478
Give me all actors starring in movies directed by and starring William Shatner.	dbr:William_Shatner	wd:Q16297
How many employees does IBM have?	dbr:IBM	wd:Q37156

Challenge Chairs

- Nandana Mihindukulasooriya (IBM Research AI)
- Mohnish Dubey (Philips Research, Netherlands)
- Alfio Gliozzo (IBM Research AI)
- Jens Lehmann (Amazon)
- Axel-Cyrille Ngonga Ngomo (Universität Paderborn)
- Ricardo Usbeck (University of Hamburg)
- Gaetano Rossiello (IBM Research AI)
- Uttam Kumar (University of Bonn)
- Debayan Banerjee (Universität Hamburg)

Challenge Programme Committee Members

The challenge program committee helped to peer-review the eight system papers. Each paper received 2 or 3 reviews from the program committee members and authors took those feedback into account when preparing the camera-ready versions. The organizers would like to thank them for their valuable time.

- Ahmad Alobaid (Universidad Politécnica de Madrid)
- Debayan Banerjee (Universität Hamburg)
- Mohnish Dubey (Philips Research, Netherlands)
- Longquan Jiang (University of Hamburg)
- Marcos Martinez-Galindo (IBM Research)
- Nandana Mihindukulasooriya (IBM Research AI)
- Cedric Möller (University of Hamburg)
- Ricardo Usbeck (University of Hamburg)

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References

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