WI-IAT 2022 Special Session Proposal: XPERT4CQA

Heading

- **Title of the special session and acronym:**
  - **Title: special session on Expert Recommendation for Community Question Answering**
  - **Acronym:**
    - **XPERT4CQA (eXPErt RecommendaTion for CommuNity Question Answering)**
- **Proposed duration (half-day or full-day):** half-day
- **special session co-chairs name, affiliation and e-mail address:**
  - Gianni Costa, ICAR-CNR, giovanni.costa@icar.cnr.it
  - Riccardo Ortale, ICAR-CNR, riccardo.ortale@icar.cnr.it
- **Short CV of co-chairs including past experience in organizing workshops and/or related events**
  - *Gianni Costa* is currently a researcher at the Institute of High Performance Computing and Networks (ICAR-CNR) of the National Research Council of Italy. He graduated summa cum laude in computer science engineering in 2003 and received Ph.D. in systems and computer engineering in 2007 from the University of Calabria, Italy. His current research interests include data mining and knowledge discovery, semistructured data, recommender systems, social network analysis and topic modeling. He is a Topic Editor of the MDPI *Data* International Journal (ISSN 2306-5729), Citescore (2019) 2.1.
  - *Riccardo Ortale* is currently a researcher at the Institute of High Performance Computing and Networks (ICAR) of the National Research Council (CNR) of Italy. He graduated in Computer Science Engineering summa cum laude from the University of Calabria. He holds a master's degree in Internet Software Design from Cefriel-Politecnico di Milano in collaboration with Siemens SBS and a Ph.D. in Computer Science and System Engineering from the University of Calabria. His current research interests include knowledge discovery and data mining, machine learning, semistructured data analysis, social network analysis and text analysis. He has served both as a referee for several international journals and as a program committee member in the context of various international conferences including IJCAI, ACM CIKM, SIAM SDM and IEEE ICDM. He has served as a Topic Editor of the MDPI Entropy International Journal (ISSN 1099-4300), IF 2.524 (2020). He has been involved in several national and international research projects.

    Gianni Costa and Riccardo Ortale organized:
    - the **First International Workshop on Expert Recommendation for Community Question Answering (XPERT4CQA)** in conjunction with the *IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT 2021)*.

    In addition, *Gianni Costa* and *Riccardo Ortale* have served as Guest Editors of the below detailed special issues:
    - Gianni Costa, Riccardo Ortale. **Automatic Disinformation Detection on Social Media Platforms** – MDPI *Data* (ISSN 2306-5729), Section "*Information Systems and Data Management*".

- Gianni Costa, Riccardo Ortale. **Role-Aware Analysis of Complex Networks** – MDPI *Entropy* (ISSN 1099-4300), Section "*Multidisciplinary Applications*".
- Gianni Costa, Riccardo Ortale. **Community Question Answering: From Recent Advances in Methods, Techniques, Models and Applications to Future Perspectives** – MDPI Sensors (ISSN 1424-8220), Section "*Sensor Networks*".

Introduction

- **Abstract: one paragraph describing the special session purpose (max. 200 words)**
Community question answering is a fundamental knowledge sharing service, with a strong impact on society. Essentially, the askers of a community post questions and rely upon the wisdom and collective intelligence of the repliers in that community, for their questions to be timely and effectively answered. Unfortunately, because of the growing number of both unanswered and newly-posted questions, repliers cannot timely answer, while askers do not necessarily receive satisfactory answers even after a long time. Expert recommendation is the process aimed to the timely sharing of high-quality knowledge from answerers to askers, which allows for routing questions to the most trustworthy expert repliers. This special session proposal aims to provide a premier international forum on all aspects of interest to expert recommendation for community question answering. In particular, the special session will
  - bring together practitioners and researchers from academia and industry, to discuss challenges, practices, principles and preliminary results, share ideas, develop innovative models, methods, techniques and tools;
  - provide a venue, where participants form an interdisciplinary research community, promoting scientific cooperation and exchanges within and across areas, for unprecedented synergistic insights and approaches;
  - advance research, through a focused analysis of open issues, emerging trends, unexplored directions and novel solutions.

- **Scope and topics of the special session**
Because of an increasing interest in academia and industry, expert recommendation for community question answering has grown into an active area of multidisciplinary research, with a vast body of contributions at the crossroads of *Recommender Systems*, *Information Retrieval*, *Data Mining*, *Machine Learning*, *Data Science*, *Knowledge Representation, Knowledge Management, Social Computing* and *Natural Language Processing*. The special session will solicit contributions reporting original and unpublished results regarding theoretical developments, principled models, methods, techniques and algorithms, experimental results, empirical evaluations of state-of-the-art approaches, evaluation metrics, experiences with new systems and related challenges, new data sets and respective analytics, application-oriented studies, promising preliminary ideas, work in progress, demonstrations and tools. All submissions will be reviewed, by rigorously accounting for their appropriateness and relevance to the special session as well as the novelty, importance, technical soundness and clarity of their contributions.

The topics of interest for the special session include, but are not limited to, the following:

1. Topical interest, topical expertise, authority, centrality, relevance, social roles, trustworthiness, confidence.
2. (Advanced) Modeling of Users, Roles and Behaviors
3. Question routing/Expert finding
4. Exploitation of External non-CQA Data
5. Dynamicity
6. Answerer Motivation

7. Exposure to Questions
8. Recommendation of Newcomers and Lurkers
9. Recommendation of Expert Answerers using Knowledge Graphs
10. Recommendation of Expert Answerers for Context-dependent Questions
11. Recommendation of Collaborative Groups of Expert Answerers

Motivation and Rationale

- **Why the special session is related to WI-IAT 2022:**
  WI-IAT 2022 is a natural fit for this special session proposal, for the following three reasons regarding its contents, commitment and consistent alignment with the solicited special session proposals.

  To begin with, the recommendation of experts in community question answering is a very active field of multidisciplinary research, with strong ties to all macro-areas of interest to WI-IAT 2022, including *data science*, *network science*, *human-centric computing*, *collective intelligence*, *knowledge management*, *autonomous agents* and *multi-agent systems*.

  Furthermore, this special session proposal is also in line with WI-IAT 202s in its commitment, which involves gathering research contributions that
  - o expand and/or deepen the understanding of the Web of askers and answerers (including all aspects of its foundations, such as trustworthiness, confidence, topical interest, topical expertise, authority, centrality, relevance, social roles, participation, intra- and inter-community interrelation, post wording and related analysis of texts, exploitation of external information sources and dynamicity);
  - o enable the development and application of original models of users' behavioral profiles, novel computational approaches and new intelligent technologies.

  Finally, expert recommendation for community question answering fully falls in the scope of the encouraged special session proposals upon *Recommendation Systems for the Web*.

  To conclude, this special session proposal is fully consistent with the general theme of the WI-IAT 2022 International Conference, i.e., "*Web Intelligence = AI in the Connected World*". In particular, this special session proposal contextualizes the foresaid WI-IAT 2022 theme in the realm of the communities for knowledge creation and sharing, thus contributing to the exploration of a particular subtheme, that can be summarized as "*AI in the Web of Connected Askers and Answerers*".

- **Why the topic is timely and important**
  Millions of users resort to community question answering, on a daily basis, in order for their information demands to be timely and effectively satisfied by trustworthy expert answerers. On one hand, the availability of question-answering communities allows askers to overcome the limitations inherent in querying search engines. Such limitations include the restricted (syntactic and semantic) formulation of questions purely in terms of keywords and the inability to engage the unexpressed knowledge embedded in communities of knowledgeable individuals. Actually, being explicitly meant to process complex, subjective, or context-dependent questions in a natural language, question answering communities allow askers to more accurately describe their questions, so that these latter can be more effectively answered. Moreover, within question answering communities, responses are the product of the collective intelligence and wisdom of the targeted-community members, which materialize as unexpressed knowledge and/or knowledge manifested in the resolved questions. Nonetheless, on the other hand, in the absence of a mechanism for routing questions to targeted answerers, the increasingly growing number of unanswered and newly-posted questions floods question-answering communities. Accordingly, responders cannot timely reply, having to indistinctly account for all questions. Moreover, askers are not necessarily provided with satisfactory replies even after a long time, since the experts who eventually take charge of their questions may not master their respective

topics adequately. Expert recommendation is a task of fundamental <u>importance</u> within question-answering communities, which allows the individual questions to be selectively routed to targeted trustworthy expert repliers, thereby enabling the timely sharing of high-quality knowledge from responders to askers. This is a <u>timely</u> topic of research in the domain of community question answering. Indeed, several open challenging issues still need to be addressed, in order to develop and apply robust, effective and efficient solutions, with which to suitably handle the currently very high rate of growth in the number of both the askers and their respective questions. Examples of open issues include (but are not limited to):

- o the development of advanced models of community members' behavior and evolutionary dynamics;
- o the accommodation of network analysis and modeling;
- o the refinement of expert recommendation through knowledge graphs;
- o the interconnection of askers and answerers from distinct question-answering communities into respective Webs;
- o the intensive use of community question answering in mobile environments, where the temporal, spatial and social context of users play a meaningful role, in addition to the specificities of their different devices, calling for new adaptive interfaces;
- o the recommendation of groups of cooperative answerers.

The recent advances in all fields of research falling within the scope of expert recommendation for community question answering are now ripe for addressing the open issues properly (in addition to possibly revisiting previous studies), by means of established and also interdisciplinary solutions. This is expected to enable a stronger beneficial impact of community question answering on society.

- **Why the special session may attract a significant number of submissions of good quality**

As a necessary premise to properly answer the above question, we observe that the overall number of publications per year on the theme of expert recommendation for community question answering has progressively increased in recent years. This trend reveals a growing interest in academia, research institutes/labs and industry, which corroborates the rationality of this special session proposal.

That said, a premier special session focused on expert recommendation for community question answering has the potential to attract a significant number of submissions for several reasons. Firstly, the proposed theme has been studied from several distinct perspectives grounded in a vast scope of relevant areas, including recommender systems, information systems, knowledge management, information retrieval, intelligent systems, knowledge representation, data engineering, machine learning, data mining and artificial intelligence. This suggests that the proposed special session can actually attract contributions from all those interested scholars and researchers, who are active in the wide spectrum of relevant areas. Secondly, as a thematic forum, it would make room for a larger number of contributions, compared to other venues devoted to more general themes. Indeed, the number of articles on the proposed theme at international conferences, symposia, workshops and journals within the scope of the relevant areas is still small, compared to the overall number of the respective publications. Thirdly, the special session would value mature approaches as well as promising early contributions on all aspects of interest, such as models, ideas, practices, experiences, systems, tools, technologies and preliminary empirical results. Fourthly, as a specialist meeting, the special session

would actually encourage submissions from authors willing to meet in a (physical or virtual) venue, with the aim to discuss challenges and opportunities, disseminate innovative developments and establish profitable scientific cooperation. Lastly, a premier international special session on the proposed theme would provide authors from different fields with the unprecedented opportunity to form one strongly-cohesive community, wherein tight cooperation and exchanges within and across disciplines allow for innovative interdisciplinary research.

All submissions will be screened by strict requirements of quality. The latter will be carefully enforced through the following actions.

- o The special session will be regularly promoted to a targeted audience via websites, mailing lists, word of mouth, online forums, WikiCFP, various relevant social media, microblogging services and networking platforms, in order to seek contributions from active experts in the proposed theme.
- o Several internationally respected scholars and established researchers will be directly invited through personal communications, to submit their contributions to the special session.
- o All submissions will be rigorously reviewed by a panel of reviewers including the program committee members and the special session chairs.
- o The quality of submissions will be evaluated in terms of their appropriateness and relevance to the special session. The novelty, importance, technical soundness, clarity, potential impact, insightfulness, depth and reproducibility of all received contributions will be also taken into account carefully.

- **Why the special session may attract a large number of attendees, in addition to the authors**

Expert recommendation for community question answering is a fertile research area. It has attracted a growing interest in academia, research institutes/labs and industry, with an increasing number of contributions from a wide spectrum of related fields, such as recommender systems, information systems, natural language processing, knowledge representation, data engineering, knowledge management, information retrieval, intelligent systems, machine learning, data mining and artificial intelligence. This suggests that the proposed special session has the potential to attract interested attendees from any of the foresaid fields. Besides, the number of attendees from each such a field is likely to be large for the following inherent peculiarities of the proposed special session. Firstly, the special session will bring together practitioners, specialists, scholars, researchers and experts, who actively contribute to proposed theme from within and across the foresaid fields. Accordingly, newcomers will be provided with an overview of the propose theme, that specifically matches the viewpoint of their research fields. Moreover, knowledgeable attendees will gain not only an in-depth and thorough understanding of all advancements within their respective research fields, but also how to harness such advances for revisiting earlier research, addressing open issues/new trends and identifying not yet explored research directions. Secondly, all attendees will be provided with the valuable and unprecedented opportunity to network with an international interdisciplinary-research community, wherein to achieve significant progress through scientific cooperation in the integration of advances, insights and perspectives from distinct fields of research. Thirdly, in addition to the traditional sharing of handouts and presentation slides, the special session will feature a highly-interactive presentation of all accepted contributions. More precisely, presentations will be carefully tuned to the attendees' expectations, requirements and questions, so that these can be clearly captured and

addressed. To this end, all presenters will be warmly invited to recommend targeted readings and other materials to the attendees. Fourthly, follow-up after the special session will be used to interact with the attendees. By soliciting their feedback[1], sharing further required materials and announcing new events of interest, it will be possible to consolidate the systematic involvement of the attendees into the international research community shaped by the special session.

- **Why the special session differs from others**
  To the best of our knowledge, no special sessions have been devoted to the vast area of multidisciplinary research on expert recommendation for community question answering. Thus, being aimed at setting up the first international special session upon expert recommendation for community question answering, <u>this proposal is unique of its kind</u>.
  In particular, it must be stressed that this special session proposal substantially differs from all traditional special sessions, workshops and conferences on recommender systems. Indeed, these latter generally focus neither on a particular task nor on a specific applicative context. Instead, the proposed special session focuses only on the task of expert recommendation, to deal with a fundamental and challenging problem, i.e., the automatic improvement of question routing, within a clear applicative context of great practical relevance to society, i.e., community question answering. Additionally, it must be stressed that the proposed special session substantially differs from traditional workshops on community question answering. Indeed, these generally focus on a wide variety of tasks, aimed to pursue different purposes. Instead, the proposed special session focuses on the task of expert recommendation, for the purpose of the automatic improvement of question routing in community question answering.

- **Related workshops and conferences of similar topics**
  As discussed in the above answer to the previous question, this special session proposal is unique of its kind. Notwithstanding, having to find some similarities with existing workshops and conferences, it is possible to consider those generically devoted to the primary areas of interest, i.e., recommender systems and community question answering, as well as other relevant areas including social network analysis, artificial intelligence and knowledge management. The major workshops and conferences on such themes are reported below, without prejudice to the substantial differences (discussed in the answer to the previous question) between these latter and this workshop proposal.

  - Workshops :
    - the First International Workshop on Expert Recommendation for Community Question Answering (XPERT4CQA) in conjunction with the IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT 2021).
    - Bias 2021: Second International Workshop on Algorithmic Bias in Search and Recommendation
    - NeuRec 2020: ICDM Workshop on Recommender Systems 2020

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[1] Invited feedback from the attendees will include the degree to which the Special Session matched their expectations, room for improvement, further requirements and questions, takeaways from the event, opportunities for learning and networking.

- OHARS: Workshop on Online Misinformation- and Harm-Aware Recommender Systems (OHARS) at RecSys 2020
- ORSUM 2020: Workshop on Online Recommender Systems and User Modeling @ ACM RecSys 2020
- INRA 2020: International Workshop on News Recommendation and Analytics
- IRS 2020: International Workshop on Industrial Recommendation Systems (conjunction with KDD 2020)
- UMAP 2020:ACM International Conference on User Modeling, Adaptation and Personalization
- SUM'20: State based User Modelling @ WSDM'20
- MoST-Rec 2019: Workshop on Model Selection and Parameter Tuning in Recommender Systems
- CQA 2012: WWW 2012 Workshop on Community Question Answering on the Web
- SIGIR 2016 Workshop WebQA II: Web Question Answering Beyond Factoids
- Web question answering: Beyond factoids: SIGIR 2015 workshop
- SemEval-2017 International Workshop on Semantic Evaluation – Task 3: Community Question Answering
- SemEval-2016 International Workshop on Semantic Evaluation – Task 3: Community Question Answering
- SemEval-2015 International Workshop on Semantic Evaluation – Task 3: Answer Selection in Community Question Answering

- Conferences
  - RecSys: ACM Conference on Recommender Systems
  - ASONAM: IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining
  - WWW: ACM International World Wide Web Conference,
  - SIGIR: ACM Conference on Research and Development in Information Retrieval
  - RecSys@FLAIRS: Recommender Systems Track at FLAIRS Conference
  - IJCAI: International Joint Conference on Artificial Intelligence
  - CIKM: International Conference on Information and Knowledge Management

Special Session Details

- **Tentative committee lists (organizers, program committee, etc.)**
  Organizers:
  - Dr. Gianni Costa, ICAR – CNR, giovanni.costa@icar.cnr.it
  - Dr. Riccardo Ortale, ICAR – CNR, riccardo.ortale@icar.cnr.it

  Program Committee responsible for the overall coordination of the scientific content of the special session:
  - Prof. Eugenio Cesario, DICES – UNICAL, eugenio.cesario@unical.it
  - Dr. Gianluigi Folino, ICAR – CNR, gianluigi.folino@icar.cnr.it
  - Prof. Elio Masciari, DIETI – UNINA, elio.masciari@unina.it

- **Expected number of participants and the expected number of submissions**
  Expected number of participants: 10
  Expected number of submissions: 7

- **A short list of potential authors that are expected to submit papers to the Special Session**

- **A draft call for papers (max 1 page)**
  Community question answering is a fundamental knowledge sharing service, with a strong impact on society. Essentially, the askers of a community post questions and rely upon the wisdom, collective intelligence and promptness of the repliers in that community, for their questions to be timely and effectively answered. However, due to the progressively growing number of both unanswered and newly-posted questions, responders cannot timely reply, while askers are not necessarily provided with satisfactory answers even after a long time. Expert recommendation is the difficult process aimed to the timely sharing of high-quality knowledge from answerers to askers, which allows the individual questions to be routed to the most trustworthy expert repliers. Because of an increasing interest in academia and industry, expert recommendation for community question answering has grown into a very active area of multidisciplinary research, with a vast body of contributions at the crossroads of Recommender Systems, Information Retrieval, Data Mining, Machine Learning, Data Science, Knowledge Representation, Knowledge Management, Social Computing and Natural Language Processing.

  The aim of this special session is to provide a premier international forum, which brings together practitioners as well as researchers from academia, research institutions/labs and industry, to discuss challenges and opportunities, present practices, principles and preliminary results, share new ideas and develop innovative models, methods, techniques and tools. The special session also provides a (physical and/or virtual) venue, where individuals and institutions are expected to gather in an interdisciplinary research community, promoting scientific cooperation and exchanges within and across areas of interest, for unprecedented synergistic perspectives, insights and approaches. The special session is a valuable opportunity to foster further research for the progress of expert recommendation in community question answering, through an in-depth analysis and an explicit focus on open issues, emerging trends, unexplored directions and novel solutions combining contributions from various disciplines in a principled manner.

  The special session solicits papers reporting original and unpublished results regarding theoretical developments, principled models, methods, techniques and

algorithms, experimental results, empirical evaluations of state-of-the-art approaches, evaluation metrics, experiences with new systems and related challenges, new data sets and respective analytics, application-oriented studies, promising preliminary ideas, work in progress, demonstrations and tools. All submissions will be reviewed, on the basis of their appropriateness and relevance to the special session as well as the novelty, importance, technical soundness and clarity of their contributions.

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11. Recommendation of Collaborative Groups of Expert Answerers

- **A description of the publicity and promotion plan**
  In order to seek contributions from several active experts and additionally invite the participation of a large number of attendees, the special session will be regularly publicized and promoted to a broad interested audience via
  - o websites (including the official ICAR-CNR Web site and the official special session Web site);
  - o personal communications to targeted audience (including contributors as well as potential attendees);
  - o mailing lists (including the DBWORLD posting service);
  - o word of mouth;
  - o forums;
  - o WikiCFP, i.e., the semantic wiki for Calls For Papers;
  - o various relevant social media (including the official accounts of the ICAR-CNR Institute as well as those of the organizers and program committee members);
  - o microblogging services (including the official accounts of the ICAR-CNR Institute as well as those of the organizers and program committee members);
  - o networking platforms (including the official accounts of the ICAR-CNR Institute as well as those of the organizers and program committee members).

- **Special Session format planned (keynote, expected number of presented papers, invited talks, panels, demonstrations, etc.)**
  The expected number of presented paper is 5. The planned format of this proposed special session consists of the following stages:
  - o Registration and handouts.
  - o Welcome and special session introduction.
  - o Presentation of special session aims.
  - o Feedback from audience to gather expectations, requirements and preliminary questions.
  - o Interactive presentation of accepted peer-reviewed papers.

- Interactive presentation of accepted demonstrations.
- Interactive presentation of accepted work in progress.
- Follow-up after the special session event.

Tentative Internal and External Schedule (Except adjustments by the Chairs to align all Special Session schedules)

- **Submission deadline**
  September 30th, 2021: Special Session Papers submission
- **Review deadline**
  October 13th, 2021: Review deadline
- **Acceptance deadline**
  October 15th, 2021: Notification of Acceptance/Rejection
- **Camera ready**
  October 25th, 2021: Final, Camera Ready Papers, Due
- **Program ready**
  November 8th, 2021: Program ready