Natural Language Processing Tools and Environments: The Field in Perspective

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Tools and environments for Natural Language Processing (NLP) originated approximately four decades ago with dictionary-based machine translation systems [1]. When examining the evolution of the field, we observe a transition from these "embryonic" systems of the fifties to the more adaptable, robust, and user-friendly environments of the nineties. Currently, the state-of-the-art in such systems is based on a wide variety of linguistic theories, cognitive models, and engineering approaches.

Although unrestricted NLP is still a very complex problem, several successful systems are available for restricted domains of discourse. Such systems range from user-dependent spoken language interfaces, to database, expert system, and operating system natural language interfaces, to a multitude of machine translation systems [2, 3, 4, 5]. Specifically, NLP tools and environments may be classified along the following categories:

- Machine Translation Systems
- Natural Language Interfaces and User Interface Management Systems
- Text Processing/Understanding Systems
- Text Generation Systems
- Speech Understanding Systems
- Speech Generation Systems
- Intelligent Writing Assistants

During these four decades of development, NLP systems have been in a state of constant flux due to the shifting designer goals and objectives, end-user expectations, theoretical and technical issues to be addressed, predictions on the potential of a hypothesis/theory/technique, and the heated debates on the inability of computing devices to model certain linguistic phenomena or perform certain tasks.

The invited panelists have extensive research and development experiences in the field. Based on these experiences, they will reflect on the past, present, and future of NLP tools and environments. Specifically, they will discuss:

- past experiences, major breakthroughs, setbacks, and unfulfilled promises,
- present state-of-the-art, research and development activities, current issues, and major problems, and
- future expectations, projections, and predictions on *evolutionary* and *revolutionary* milestones in the development of the field, as we head into the twenty-first century.

Additionally, the panelists will address the continuing significance of NLP systems in computer-human interaction, the problem of "scaling up" to real-world knowledge and its emerging solutions, integration of traditional NLP methods with connectionist techniques and multimodal interaction technology, and new tools and techniques for managing stories and questions.

References

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