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NEW GENERATION COMPUTING

Renewal of the Major Fields of *New Generation Computing* Vol. 40 (2022)

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Introduction

Upon the retirement of the area editor Kouzou Ohara, we are happy to introduce a new editor, Yoji Kiyota, who renews the area in the journal "Data Mining". The description of this major field follows this introduction.

We sincerely hope that this research area will make the journal contribute even more to new computing paradigms and computational intelligence.

Editor-in-Chief Masayuki Numao
Osaka University
Associate Editor-in-Chief Yutaka Matsuo
The University of Tokyo

Data Mining

The field of data mining emerged around the 1990s, and has made significant progress in sync with the paradigm shifts in computing. Availability of substantial data resources on the Web since around 2000 and the expansion of data mining applications have led to the emergence of huge technology companies as well as many people around the world enjoying the fruits of data mining through Web services. The development of deep learning since the 2010s has expanded the field of data mining to multimedia information such as natural language, images, and videos, and furthermore, the fruits of data mining have become familiar to our daily lives. The cycle continues, with data mining technologies creating a huge market, and

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accumulated huge capital generating further accelerating research and development of data mining technologies.

The fact that data mining has become huge businesses with huge impacts on society has also brought about a major change in the context of the field of data mining. The rapid growth of cyberspace, where data mining can be used to great effect, and the development of technologies such as mixed reality and augmented reality that integrate cyberspace and real space have increased the need for data mining technologies that encompass both cyberspace and real space. On the other hand, the growing influence on society has sparked debate over ethical issues such as bias and discrimination caused by data mining, and social acceptability, and has led to the development of guidelines on data mining and data mining methods that reduce ethical issues (e.g., fairness-conscious machine learning and privacy preserved data mining). Significant investments are also being made in applied data mining research to address various social challenges facing human society (climate change, declining birthrate, aging population, and escalating cyber warfare).

New Generation Computing welcomes articles that contribute to advanced topics related to data mining methods as well as those that open up new frontiers in data mining (e.g., convergence of cyberspace and real space, ethics, fairness, social acceptance, social challenges, etc.). The typical sub-fields of interest include, but are not limited to:

fundamental data mining methods (e.g. frequent pattern mining, stream data mining, graph and network mining, relational data mining)

text and web mining

statistical methods for data mining

machine learning methods for data mining

visualization methods for data mining

practical applications of data mining

data mining across cyberspace and real space

ethics of data mining (e.g. bias, fairness, privacy, social acceptability)

data mining to solve social issues (e.g. climate change, declining birthrate and aging population, cyber warfare)

Area Editor Yoji Kiyota
AI Strategy Division, LIFULL Co., Ltd.

The definitions of the other seven fields are detailed in the announcements [1–4]. In summary, the area editors of the eight major fields are shown in Table 1.

Table 1 Area editors

Area	Area Editor
Learning	Ayumi Shinohara
Data mining	Yoji Kiyota
Cognitive computing	Ryutaro Ichise
Programming and semantics	Ichiro Hasuo
Theory of natural computing	Shinnosuke Seki
Bio/nano/molecular computing and engineering	Satoshi Murata
Skill science and philosophy	Masaki Suwa
Computational social science	Fujio Toriumi

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