Spatial Gems 2019 Workshop Report
The 1st ACM SIGSPATIAL International Workshop on Spatial Gems

John Krumm[1], Cyrus Shahabi[2], Andreas Züfle[3]
[1]Microsoft Research AI, Microsoft Corporation, USA
[2]Computer Science Department, University of Southern California, USA
[3]Department of Geography and Geoinformation Science, George Mason University, USA
jckrumm@microsoft.com, shahabi@usc.edu, azufle@gmu.edu

1 Introduction to Spatial Gems

Researchers and practitioners working with spatial data often develop fundamental new techniques they would like to share with their community. These are not necessarily new research results, not yet in any textbook, but they are interesting, self-contained techniques for doing something useful in the domain of spatial data. We call these techniques "spatial gems".

The goal of this workshop is to publish several spatial gems contributed by the participants. While a gem may have already been published as a small part of a paper, extracting it into a gem makes it much more likely to be found and used by others. Good gems will stay relevant for a long time. Each gem will be two to six pages long. Where appropriate, a good gem will include numerical examples so programmers can verify their implementations, but it should not be a research paper with results on multiple test cases. Spatial gems should be reproducible and usable. Thus, we encourage authors to provide implementation details and code whenever possible. Code can be included in short blocks of code in the paper, or longer code can be shared in an open source repository with a pointer in the paper. At the workshop, participants work together to edit all the accepted submissions for clarity and utility, with the goal of creating a reference archive of spatial techniques.

2 Spatial Gems 2019 Submissions

The 1st ACM SIGSPATIAL International Workshop on Spatial Gems (Spatial Gems 2019, https://www.spatialgems.net) was held in conjunction with 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems in Chicago, Illinois, USA. The first Spatial Gems Workshop had nine paper submissions which were reviewed by eight program committee members. Each paper was assigned to three reviewers and all papers received at least two reviews. While the number of submissions was low, the quality of the submissions was high. Among the seven accepted papers, reviewers recommended 13 accepts, two neutrals, and one reject and the workshop had 10 registrations.

3 Spatial Gems 2019 Workshop Program

Spatial Gems puts the "work" back in "workshop". Therefore, the goal of this workshop is not only to present research, but also for workshop attendees to team up and to hands-on work on each others papers in LaTeXduring the workshop. For this purpose, the workshop was split into three parts:

1. Paper Presentations
2. Editing Session I
3. Editing Session II

3.1 Paper Presentations

After a short introduction by the chairs, the workshop kicked off by having ten-minute presentation for each accepted spatial gem:

- First, Gil Wolff introduced a heat map segmentation algorithm to automatically detect high density areas among a background of low density areas [7] ("Heat map segmentation"),
- then, ABM Musa presented an algorithm for online trajectory compression that allows to specify error and delay bounds [5] ("Online location trajectory compression"),
- Tin Vu demonstrated a standard method for generating synthetic spatial data that can be used in benchmarking and scalability tests [6] ("Spatial data generators"),
- then, Andreas Züfle showed an efficient, complete, and sufficient techniques to determine spatial domination of multidimensional rectangles [1] ("Complete and sufficient spatial domination of multidimensional rectangles"),
- Next, Randolph Franklin presented simple representations of polygon and polyhedra for efficient computation of area and volume [2] ("Minimal representations of polygons and polyhedra"),
- Joon-Seok Kim described a simplification for polygons specialised for building footprints [3] ("Simplification of indoor space footprints"),
- Finally, given two normally distributed location measurements of a moving object, John Krumm presented an approach to compute the speed distribution of this object [4] ("Speed distribution from normally distributed location measurements").

During the presentations, we had about 15 people in the room. After these short presentations, workshop attendees were split into small teams of two to three people to work hands-on the LaTeXsource code of each others papers in two editing sessions.

3.2 Editing Session I

To ensure that attendees were assigned to teams that match their interests, each workshop attendee anonymously provided a list of papers that they preferred working on. These preferences were fed to a matching algorithm during the coffee break at 10:30am and workshop attendees were assigned to the resulting groups after the break.

After the coffee break, at 11:00am, the assigned groups got together and received printed hard-copies of each others papers. Each team had 30 minutes to read each others paper to provide constructive feedback. Authors were instructed to focus on improving readability and ease of understanding, to improve the impact and usability

of each others spatial gem. After this reading phase, teams had 30 minutes to discuss and implement changes in the LaTeXsource code. For this purpose, all workshop papers were required to share their code in Overleaf to work concurrently on their papers. Changes of the papers included minor edits related to grammar and typos, but also major changes to clarity such as adding examples, adding motivation, or removing unnecessary sections for brevity.

During the nature of hands-on working on each others papers, the editing sessions mainly had authors and workshop organizers working on the papers, as well as a few students looking to improve their LaTeXwriting skills. The room had an average of 10 people in the room during these sessions.

3.3 Editing Session II

The matching algorithm used for Editing Session I was re-run during the lunch break from 12:30-2:00pm, subject to the constraint of not assigning any groups that had previously been assigned in Editing Session I. All workshop attendees reassembled at 2:00pm, were assigned to their new groups, and received updated print out of their assigned paper(s) to reflect that changes made in Editing Session II.

Again, each team was given 30 minutes to read each others paper and another 30 minutes to discuss and implement changes directly in the LaTeXcode. Editing Session II took much longer than the planned 2:00-3:30pm, as workshop members had now read many of each others papers, such that discussions about styles and best practises of paper writing were discussed across teams. Also, since we had an odd number of workshop attendees, each editing session had one team of three, which required each team members to read, discuss and edit two other paper. Discussions and editing continued well beyond the final break at 3:30pm.

After the extended Edition Session II, the workshop decided not to implement a third editing session, as most workshop attendees had already read most other workshop papers, and especially the papers that they were most interested in. Thus, we decided to extended Session II, and afterwards, concluded the workshop at around 4:00pm.

References

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