Boundaries that Matter: Partisan Gerrymandering of U.S. Congressional Districts

By Mark Salling, PhD, GISP, Maxine Goodman Levin College of Urban Affairs, Cleveland State University

GIS professionals like to believe that the technology they love does much good in the world. After all, it is used to plan, evaluate, and manage roads and transportation systems, water and waste water systems, land use and real estate, parks and environmental systems, and much more. It helps save lives and resources; just take a look at the work of URISA’s GISCorps for a look at the humanitarian volunteer work of GIS professionals.

But beware! Like any tool, maps and mapping technology can also be used to do harm.

For example, let’s take the drawing of our political election districts that GIS facilitates. I believe that redistricting is one of the most important applications of GIS technology. The data and software used are more powerful than ever and those who know best how to use them wield tremendous power over all of us, too often determining who represents us in government and what policies and programs guide our daily lives.

Partisan gerrymandering is drawing the boundaries of electoral districts in a way that gives one party an unfair advantage over its rivals. It is a common practice across the country. Partisan redistricting of our election districts is implemented with the data and tools we GIS professionals enjoy and celebrate, but in that application is too often used to deprive us of the truly representative democracy that our constitution intended.

At this writing, the Supreme Court may be making game-changing decisions on some pending cases very soon.

Who draws the maps?
The Constitution leaves redistricting up to the states. In general, there are few rules beyond equal populations (see discussion below) though the Voting Rights Act of 1995 mandates that, when possible, districts must be created in which minority racial groups compose more than half of the population. These are called majority-minority districts.

In most cases, congressional districts are drawn by the state legislature, and the majority party controls the process, though a governor’s approval may also be required. A few states require bi-partisan or non-partisan commissions to oversee the line-drawing.

2 I focus on congressional redistricting but the issues also apply to state and local legislatures.

3 See https://ballotpedia.org/Majority-minority_districts

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1 I made this same assertion in “GIS Will Affect the Political Landscape for the Next Decade and Beyond”, GIS Professional, March/April 2011, Issue 242, pp. 1-3.
And the state’s governor and majority party leaders often control who is appointed to these commissions. Arizona, California, Idaho, and Washington draw districts using independent commissions with regulations limiting direct participation by elected officials.4

Some states are moving toward involving citizens in the redistricting process and creating truly independent redistricting commissions. More on this is discussed below.

The Principles Involved

Our shared concept of democracy includes two principles considered here: 1) one person, one vote, and 2) the government should not suppress free speech.

First, “One person, one vote” is the rule that, under the Equal Protection Clause of the Constitution (14th Amendment), legislative voting districts must be very close to the same in population size. The idea behind the rule is that one person’s voting power ought to be roughly equivalent to another person’s.5

The second principle is that “viewpoint discrimination” by government that restricts speech with a particular opinion violates the First Amendment. A variety of Supreme Court cases have held that such violations of the Constitution apply to the drawing of political districts.6

At this writing, the U.S. Supreme Court is deciding a few very critical cases. In November 2016, a panel of three federal judges ruled that a map drawn to favor Republicans in Wisconsin was unconstitutional.7 It is the first time that partisan gerrymandering was struck down in federal court. The decision was appealed to the Supreme Court and it heard arguments in October 2017. A decision is expected in the spring of 2018.

Importantly, the plaintiffs in the case provided a clear mathematical formula to measure the degree of partisanship in the map’s outcome concerning the one person, one vote principle. The “efficiency gap” measures the amount of votes that are wasted (unnecessary) in determining an election’s outcome. Wasted votes occur when districts are drawn to pack the opponent’s voters in few districts while spreading out one’s own party voters in districts enough that are still expected to be safely won. Counter arguments include the notion that there is a “natural” packing of like-minded voters that is difficult to avoid – such as Democratic voters in large urban cities.

Both political parties have been accused of partisan gerrymandering. In Benisek v. Lamone, Republicans contest the legality of one district in Maryland, claiming partisan gerrymandering that violates the voters’ First Amendment rights. Though denied a preliminary injunction by a three-judge federal panel, they appealed that denial to the Supreme Court, which will hear the case on March. Other law suits on partisan gerrymandering may make their way to the Supreme Court as well.

Representational Fairness

In addition to the issue of wasted votes (denying their approximate equality), another concern with extreme partisanship in drawing district geographies is the concept of “representational fairness”, in which the proportion of election wins by the political parties should reflect the approximate number of votes for each party.

In the 2016 general election, Republicans won 55.4 percent of the seats across the nation with only 50.6 percent of the vote, resulting in 21 seats won by Republicans more than their share of votes would indicate. But it works both ways. In the period between 2002 and 2010, when Democrats had complete control, they won 18 more seats than their vote share would indicate; when Republicans controlled congressional redistricting in that period, they won 16 more seats than their share of votes in those states would warrant.

Ohio: A Case Study

Ohio provides a good example a partisan process in which the state legislature draws congressional districts. Republicans have been in control of the process since 2001.8

Figure 1 illustrates the effect of highly partisan gerrymandering.9 With only 58.2 percent of the votes in the state, Republicans won 75 percent (12 of 16) congressional seats in the 2016 election. In fact, in every election year, except one, they easily won more seats than their percentage of votes would suggest. That one exception was 2008 and reflects the effect of the Barack Obama candidacy. The party drawing the congressional map in the 2002 to 2010 period, when Ohio had 18 seats, won an average of 2 seats more than what the proportion of votes would have produced if proportion of wins closely corresponded to proportion of votes for the two parties. The controlling party did even better for themselves in drawing districts in 2011, winning almost 3 more of the 16 seats on average than their vote totals would indicate in the 2012 to 2016 elections.

Clearly, boundaries were unfair in representing the overall will of the state’s voters.

Competitiveness

How politically competitive must a district be to ensure with some

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4 For a description of the process in each state see http://redistricting.lls.edu/who.php.
5 Reynolds v. Sims, 377 U.S. 533 (1964)
7 [Gill v. Whitford (2016)]
8 The control of congressional redistricting is a result of partisan control of the process of drawing the state legislative boundaries as well. Control the state legislature and also control the congressional map. For a discussion of how the state legislative redistricting process in Ohio affects congressional redistricting in the state see Salling, Mark, “Redistricting Congressional Districts in Ohio, An Example of a Partisan Process with Long-Lasting Consequences,” in Miller, William J. and Jeremy D. Walling, eds. 2013, The Political Battle over Congressional Redistricting. Lanham, MD: Lexington Books
9 Please note that the presentation of data showing the benefits that Republicans gained as a result of their control of redistricting is not a condemnation of that political party. The Democrats would likely have done the same thing if they had the opportunity. This is an argument about the importance of redistricting and the impact that the use of GIS in partisan redistricting has on election outcomes – regardless of which party is in control.
confidence that either party’s candidate can win? After all, if you are drawing the district boundaries, you want to spread out your voters to as many districts that are still likely to go your way as possible. Avoid having too many competitive districts where the other party has reasonable chance of winning. While producing as many “safe” districts for your party as possible, pack the other party’s voters to as few as possible. Minimize competition.

It is generally accepted that competitive districts are those in which winning and losing candidates are within five or ten percent of the vote totals. Ranked from lowest to highest, Figure 2 shows the average vote shares for Democratic candidates in the 16 Ohio congressional districts in the 2012, 2014, and 2016 elections. All 16 districts were outside the liberally defined 10 percent range of competitiveness. Among the 12 districts dominated by Republican voting, the Democratic candidates got within five percent of the Republican winner in only two of 36 races in three election years. In the four districts where Democratic party candidates dominated, none of the Republican candidates exceeded 35.9 percent of the vote, and Republican candidates averaged only 24.2 percent of the vote in the 12 races in the period.

In other words, while the overall party preferences among the electorate in Ohio leaned Republican (see Figure 1), the party drawing the boundaries with nearly complete autonomy was able to pack the other party’s voters in few of the districts. One district, with just over 50 percent African Americans but with an average of 86.5 percent Democratic voters in the decade, was created to satisfy the federal court’s mandate to create a majority minority (African American) district. Clearly, the Republicans were able to not only meet the Voting Rights Act requirement with that district, but also to pack it with other Democratic voters. That district went uncontested by the Republicans in the 2012 election.

Clearly, extreme partisan redistricting deprives many voters of an equal say in their government and in expressing their political views. And that does not hold merely for one election. Through the added advantage of incumbancy, subsequent elections also were won by the party in control.

Wasted Votes
In districts in which the outcome is not in much doubt many voters lose the importance of their vote; they voted for either the winning candidate when it was not necessary or they voted for the losing candidate. Though some wasted votes are of course inevitable, they are more numerous in noncompetitive districts. The more non-competitive districts there are, the more votes are wasted. Figure 3 shows the number of wasted votes are significantly greater for Democratic voters than for Republican voters in Ohio in 2016 congressional races because of partisan gerrymandering. Approximately 72 percent of the votes cast by Democratic voters were wasted, while only 33.8 percent of Republican voters could have stayed home on election day without affecting the outcome.

If GIS is Used to Create the Problem, Can GIS also Fix the Problem?
GIS provides the critical tools needed for the redistricting task, enabling the user to draw lines on a map and get the resulting population and recent election results almost instantaneously. Move a boundary and see the population and election results data in each


11 The number of wasted votes is the sum of votes that are more than the number of votes necessary for the winning candidate, plus votes for the losing candidates.
But if GIS provides the tools to engineer district geographies that create partisan outcomes, it also provides the ability to measure, compare, and evaluate district plans. GIS gives us tools to calculate compactness of districts, their contiguity, the number of fragmented communities, the competitiveness of each district, and the representational fairness of the overall plan.

GIS can also give the public a say. Traditionally, redistricting often takes place in political backrooms, involving politicians and consultants in making partisan political decisions. Today more than ever, many “good government” advocates argue that the process should be brought into the open and use widely accepted criteria that are thought to improve the “fairness” of the boundaries. These demonstrations have proven that less partisan and fairer districts are not difficult to produce.

The author participated in one such demonstration project in Ohio in 2009. It proved that, using a set of metrics aimed to produce compact, nonpartisan, and competitive districts, citizens could draw district plans that scored better than the existing district geography produced by the legislature. Another effort to put GIS as a redistricting tool into the hands of citizens was produced by the Midwest Democracy Network following the 2011 redistricting season. It too found that all the plans completed by citizen consultants in making partisan political decisions. Today more than ever, many “good government” advocates argue that the process should be brought into the open and use widely accepted criteria that are thought to improve the “fairness” of the boundaries. Several demonstrations of the use of public participation GIS have been conducted to let citizens create redistricting plans that include metrics challenging the boundaries that the politicians created. These demonstration projects have proven that less partisan and fairer districts are not difficult to produce.

These demonstrations have not been put into practice in our elections. However, instead, reform efforts in a number of states have generally proposed commissions to replace state legislators. The proposal in Ohio includes language that encourages competitive districts and representational fairness, and that limit community fragmentation. It also provides for citizens to submit plans to the commission for consideration, even providing that the Secretary of State provide the data and software via the Internet for such submissions. The sponsors of this initiative are currently collecting signatures to put the measure on the ballot in November of 2018.

While the proposed change in congressional redistricting in Ohio has much merit and would certainly be preferable to the existing process, more could be done. Specifically the process could require metrics be used to evaluate submitted redistricting plans. Perhaps the commission would then have the option of selecting from the best scoring three or four plans that met minimum thresholds. Regardless of the details, having a process of selecting the redistricting plan from pre-defined measurable criteria and from public submissions makes the process far more fair and democratic.

**Conclusion**

Though GIS facilitates drawing boundaries in favor of one candidate or party over others, it also now offers more potential than ever to evaluate redistricting plans. And because of advances in GIS and the Internet, there will be more scrutiny of the redistricting process and outcomes than ever before. Today’s technology makes drawing boundaries by non-experts relatively easy. And it facilitates comparisons of plans using “nonpartisan” and “fairness” measures – such as representational fairness, compactness, community fragmentation, and others. Non-partisan and fair election interest groups, especially, should be able to suggest plans that, based on measurable criteria, may be judged “better” by the public than those that the politically partisan decision makers draw.

Engaging the public in the process through available, constantly improving technologies and using measurable criteria would be the best solution for fair and democratic redistricting. Through this public participation application of GIS, there is a better chance than ever that we can get closer to the objective of one-person-one vote and reduced suppression of the voters’ political will in our elections.
GIS-Pro & CalGIS 2018
October 9-12, 2018
Palm Springs, California

Featured keynote speaker
– Jack Dangermond

Program coming soon!
The committee meets in early March to review presentation proposal submissions and develop the education content.

Check out this Story Map of Palm Springs attractions. You might want to plan an extended visit in October!
People management has drastically changed since earlier decades, where the corporation was king and people were just workers to serve operational efficiency. The operational model for today is mission, purpose and sustainability. Today, teams and team leaders are kings. How can you improve your team or organizational bottom line? Here are seven proven methods that will help.

1. Vision and mission
In his book The 7 Habits of Highly Successful People, Stephen Covey wrote, “Start with the end in mind.” What is it that you want? What is in it for others to follow you? There has to be something bigger than you that others can grasp and buy into. Why does your organization exist? It is not to make money that is a result. Workers today want to work for organizations that can show a purpose or cause. Google’s mission, for example, is “to organize the world’s information and make it universally accessible and useful.” Today Google dominates 75% of the U.S. online search market.

2. Goals
Everyone sets them in January. Whether it’s to lose weight or exceed your sales forecast, most people begin setting and evaluating their goals at the first of the year. And then what happens? The goals go in a drawer or hidden in an electronic file never to see the light of day until someone asks. So put your goals on display so that the team and you can see the goals on a daily basis. Why? Out of sight means out of mind. Keep your goals in front of the people in charge of accomplishing them and ask them about their progress on a routine basis—preferably on a weekly basis. Ask them how they are doing and what can you do to make the goals easier to accomplish. Watch what your team does.

3. Expectations
Only 30% of employees know what is expected of them at work. Your goal is to get people to work and perform together. People will live up or down to the perception of your expectations of them. If they think you believe in their abilities and expect them to do well, they will. Remember, if people don’t know what you expect, don’t be surprised by what you get.

4. Feedback
Feedback is craved by high performers and by all employees as well. Positive feedback grows and negative feedback stifles. Catch your employees or team members doing the job right and watch when they continue. They will do more of what generates positive feedback.

5. Treat everyone fairly but not equal
The people you work with are all unique individuals, and although you need to treat each one fairly, that does not necessarily mean equally. They have different values, wants, backgrounds, skillsets, experience, and most likely are at different stages of their careers. One size fits nobody. Great managers play chess; average managers play checkers. In checkers all of the pieces move in the same direction. In chess, all of the pieces move differently and the key to success is knowing the differences between the pieces, how each piece moves and how to create a strategy that maximizes the moves for all of them. Another key piece of the puzzle is showing your team that you genuinely care about them. They need to know you have their interest at heart, people want to know that someone at work cares about them as a person.

6. Provide tools and resources to do quality work
Most people don’t wake up in the morning and say to themselves, “I think I will go to work today and do a bad job.” Most people want to do quality work. Part of that is having the tools and resources to do a quality job. Ask your people what you can do to make their job easier. Reaffirm your commitment and caring to them. If they say, “I need a new widget maker,” get it. Provide them with the resources they need to succeed. If they say they don’t need anything, your response should be – “I guess I can expect quality work.” You want to take away any and all reasons people can conjure up for failure. You only leave a path to success.

7. Celebrate success
What do organizations do when they accomplish a big thing? Well, they move on to the next “big” thing. It is important to stop and celebrate with your teams. Allow people to share the memory of what has been accomplished. Simple things like handwritten notes are important too. Write notes to your people, yes the old fashioned hand-written notes, saying thank you for what they did and how their contribution lead to the overall achievement of the group. They might even post them on the wall of their work space, on their desk or possibly even on the family refrigerator!

The seven pillars can help separate your organization from the competition in your industry. If you are team leader, it can help you and your team standout within any organization. People who are working in organizations with purpose are much more likely to be promoters of their employers and managers. Not only do they...
ABOUT THE AUTHOR:
Jan Makela is an executive coach, highly-sought after speaker, and best-selling author of Cracking the Code to Success and Be the Manager People Won’t Leave. Jan has a long and successful history of working with companies to ensure quality hiring and training practices. His specialty revolves around strength-based leadership development, with a particular focus on working with senior and mid-level executives, business owners, and professionals. For more information on Jan Makela, please visit www.StrengthBasedLeadership.net.

Is GIS Leadership & Management Training on your Professional Development To-Do List in 2018?
You’ve got two opportunities to attend the popular URISA GIS Leadership Academy in the coming months.

The Columbus program is almost full. Don’t delay a minute longer!
The discounted early rate for Salt Lake City is available until March 15.
Make your plans early! http://www.urisa.org/education-events/urisa-gis-leadership-academy/

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2017 URISA GIS Salary Survey Executive Summary:

A preview of the 2017 URISA GIS Salary Survey includes valuable summary data from the survey results. The full publication with an abundance of detailed tabular data and extensive cross-tabulations will be included in the full publication release in early 2018. That publication will be available for purchase.

Quick Hits from 2017:
- The survey is based on 3,060 respondents who are employed full-time.
- The average salary of survey respondents was $70,857 - an increase of 15% over the 2010 average of $61,540.
- GISPs, on average, earned $10,000 more than non-GISPs.
- A majority (57.7%) of respondents are employed within some level of government, from local to federal agencies.
- Most receive additional forms of compensation including health insurance, paid conference attendance, life insurance, paid training, pension/retirement plans and 401(k) plans.
- They spend an average of 70.8% of their time performing geospatial tasks and work an average of 41.6 hours per week.
- The minimum level of education required for their position is a Bachelor’s degree.
- They have an average of 13.5 years of professional experience and have been in their current position for an average of 6.8 years.
- Less than half (42.5%) were GISPs.
- Two-thirds were male and the average age of respondents was 40.5 years.
- Most (90.4%) respondents were from the U.S. with the greatest concentration from the South Atlantic, Pacific, Mountain and West South Central regions.
An extensive president’s message from Teresa Townsend is in development for the next issue.

2018 URISA Exemplary Systems in Government Awards Process Opens

URISA is pleased to announce the Exemplary Systems in Government (ESIG) Awards process for 2018. Since 1980, URISA’s ESIG Awards have recognized extraordinary achievements in the use of geospatial information technology that have improved the delivery and quality of government services. The award competition is open to all public agencies at the national/federal, state/provincial, regional and local levels. Winners will be recognized during the Awards Ceremony at GIS-Pro & CalGIS 2018 in Palm Springs, California (October 9-12, 2018).

Submissions are invited in two categories:

- **Enterprise Systems**: Systems in this category are outstanding and working examples of using information systems technology in a multi-department environment as part of an integrated process. These systems exemplify effective use of technology yielding widespread improvements in the process(es) and/or service(s) involved and/or cost savings to the organization.

- **Single Process Systems**: Systems in this category are outstanding and working examples of applying information system technology to automate a specific SINGLE process or operation involving one department or sub-unit of an agency. The system application results in extended and/or improved government services that are more efficient and/or save money.

Submissions are due on or before Monday, June 4, 2018.

The comprehensive application requires details about the Jurisdiction/Organization, System Design, Implementation, Organizational Impact and System Resources.

The application is online, along with the 2017 winning submissions and accompanying organizational videos. Visit: http://www.urisa.org/awards/exemplary-systems-in-government/

“I believe the award has done two things for me professionally. The first relates to leadership. The award was a source of pride for my team and reinforced the team’s belief in my ability to pull all the pieces together to develop a product worthy of national recognition and their ability to be successful in their roles. The second relates to credibility. Many of the District’s senior leaders have little experience in GIS. However, many of these leaders are familiar with URISA. Receiving this award has reinforced their decision to entrust me with this large, complex project and has demonstrated that I can deliver despite the statistics related to failed and overly expensive IT projects.”

- Don Nehmer, Capital Program Business Manager, Milwaukee Metropolitan Sewerage District, WI - SewerView, ESIG Enterprise Systems Category - Distinguished System

“It was an honor to receive the ESIG award from URISA. By participating in the ESIG award process we were able to exercise another reason to evaluate our system. By doing so, we were able to find ways to improve our current system. We also received local media exposure because of the ESIG award, this helped us inform the Forsyth County public of how we were applying GIS for public safety in their county. This award also validated all of the hard work and development that went into this system, this helped the GIS department fortify a trust with the Forsyth County Administration.”

- John Kilgore, GISP, GIS Director, Forsyth County, GA - GIS Mobile Emergency Response System (ERS), ESIG Single Process System Winner
Preparing for GISP Certification Webinar – Free opportunity for URISA International Members Only

- April 3, 2018: 1:00 – 3:30 PM Eastern
- April 4, 2018: 1:00 – 4:30 PM Eastern

The GISP has become a respected and in-demand indication of your skills as a GIS professional. If you are pursuing the GISP credential, or are thinking of doing so, join us on April 3 and 4, 2018 for a six-hour, two day virtual event, as a group of talented GIS experts share valuable information that can increase your chance of success.

Earning the GISP credential requires successfully completing an exam as well as a number of other application requirements.

- Day one (Tuesday, April 3) will explore the reasons that the GISP credential is worth pursuing as well as what is involved in completing each part of the application.
- Day two (Wednesday, April 4) will explore the topics that you need to be familiar with for each of the knowledge areas covered by the GISP exam.

Information presented in this webinar is designed to help professionals who have extensive GIS education and experience, but need to know what topics to review prior to taking the exam. It also will help individuals with some GIS experience that may be lacking in one or more areas covered by the exam and that need to know where to find additional resources to study.

The webinar agenda will be as follows:

**Tuesday, April 3, 2018**

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<td>1:00 to 1:30</td>
<td>GISP: The Road To and Through an Exam</td>
<td>Tripp Corbin</td>
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<td>1:30 to 1:35</td>
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<tr>
<td>1:35 to 2:05</td>
<td>Overview and Planning Ahead</td>
<td>Tripp Corbin</td>
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<td>2:10 to 2:50</td>
<td>Education Achievements</td>
<td>Kevin Mickey</td>
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<td>2:50 to 3:25</td>
<td>Experience Requirements and Documentation</td>
<td>Keri Brennan</td>
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<tr>
<td>3:25 to 3:30</td>
<td>Contributions to the Profession</td>
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**Wednesday, April 4, 2018**

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<td>Knowledge Category 1. Conceptual Foundations</td>
<td>Gary Kent</td>
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<td>1:35 to 2:05</td>
<td>Knowledge Category 2. Cartography and Visualization</td>
<td>Xan Fredericks</td>
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<td>Knowledge Category 3. Geospatial Data</td>
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<td>Knowledge Category 4. GIS Analytical Methods</td>
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<td>3:25 to 3:55</td>
<td>Knowledge Category 5. Data Manipulation</td>
<td>Carl Anderson</td>
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<td>4:00 to 4:30</td>
<td>Knowledge Category 3. GIS Design Aspects and Data Modelling</td>
<td>Lorne Dmitruk</td>
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This FREE event is offered only to URISA International members. You may register for one or both days. Participation is limited, so don’t delay.

Register Now
GISCorps (www.giscorps.org) is run by volunteers with the support of its parent organization, the Urban and Regional Information Systems Association (URISA). However, its operations depend entirely on donations from allied organizations and individual support from people like you. DONATE HERE!

What is URISA’s GISCorps?

GISCorps is Volunteerism

GISCorps is a passionate team of volunteers and leaders in the geospatial industry who are dedicated to service to the global community. There are over 5,000 GISCorps volunteers, from 133 countries, world-wide, ready to respond to requests for technical assistance. A core group of volunteer leaders organize and assign these volunteers to projects based on need and skill sets. Using tools that include OpenStreetMap and Esri’s ArcGIS Online, these volunteers help respond to natural and man-made disasters, assist in community building, and support sustainability for underserved and underdeveloped communities. —222 projects completed and counting!

GISCorps is Disaster Recovery

GISCorps participates in projects that assist in the assessment and recovery operations from natural and man-made disasters. From hurricanes and earthquakes to epidemics and homelessness, GISCorps volunteers provide innovative support and GIS services to national, local, and regional government agencies, as well as to NGOs and non-profits.

GISCorps is Community-Building

GISCorps lends its support to programs that create stronger communities. Projects have included blight analysis, site analysis, and assisting in the building of geospatial capacity for organizations that are working to build a more compassionate and just world.

GISCorps is Sustainability

GISCorps leads geospatial projects that enhance the capabilities of governments, private and non-profit organizations, and grassroots groups to tackle the challenges of a planet that offers limited resources to growing populations. GISCorps has assisted on projects that address food scarcity, climate change, and education across the globe.

URISA is a 501c(3) charitable organization. Contributions are tax-deductible in the U.S. Please donate today!
Mobile Government Strategy: Take GIS to the Field and Back

Turn a routine data collection expedition into a data goldmine with GIS. From the very moment that your crew heads into the field, geo-powered data guides and simplifies their tasks. Data collection is exact and instantly useful back in the office. A perfect suite of apps, all working together to make your field operations smooth and efficient.

Next time, send your field crew out with ArcGIS, the mapping and analytics platform with a mobile strategy built in.

Learn more about building a government strategy with GIS at go.esri.com/URISA-mobile.
As a working professional, you have probably heard many stories of how other people credited their success to their mentors. Working with a mentor can truly pave the way to success in one’s career, but oftentimes creating—and maintaining—the mentor-mentee relationship can be challenging. Maybe your company does not offer a formal mentorship program, or maybe you simply feel that you’re not receiving much value out of your current mentor.

The key to crafting a successful relationship with a professional mentor is to look outside the box and identify individuals who can offer the best professional guidance.

Discover Your Mentors: Not Every Mentor is Obvious

A mentor is someone who watches out for you and gives you advice. Unlike a “forced” relationship between a boss and subordinates, or a contract relationship between a coach or a teacher and students, the relationship between a mentor and a mentee is often informal.

Often, they don’t wear a hat titled “Mentor”, and they may not be older than you or senior in professional ranking. You may not even realize someone is playing a mentor role in your life or career until much later.

There’s a tendency to determine the value of advice based on who it came from. When you receive guidance from someone that you regard as your superior—someone with an impressive title—you’re more likely give their advice more weight and take it more seriously. But sometimes, the most insightful advice may come from someone among your peers, an outsider, or even someone you considered less knowledgeable than you. Sometimes the most innovative idea may come from a novice in the field. For a senior manager, you may find the best perspectives come from your subordinates or people of the lowest rank in your business.

Have you noticed mentors in your life or in your career? Do not dismiss too easily advice from someone about whom you thought, “What does he know about this?”

Keep an open mind and a humble attitude; your best mentors could be anywhere.

Asking for Help Is a Sign of Strength, Not Weakness

Now that you know how to discover your mentors, you need to learn when to seek their help.

Your passion may be in starting your own business, or adding value to your existing professional position. With an abundance of easily accessible information online or in books, you can often get started on your own.

There is tremendous value in self-teaching, learning through practice, and learning through mistakes. Those are important skills that can carry you far and keep you growing for the long run.

But it is important to recognize when to seek out help. Some skills can only be accumulated over time, but some are a matter of knowledge and experience. There is no need to reinvent every wheel. Human progress is made on the foundation laid by previous generations. You reach further by standing at a higher ground to start with, so it is important to recognize when to ask for help. Asking for help where it matters is a sign of strength, instead of weakness.

Getting the right help at a certain point could make a difference between years of detours and missing the best opportunity, and gaining fast momentum early so you’re at the right place at the right time.

How to Get the Most Out of a Mentoring Relationship

Since mentors are not “obligated” to you like in relationships bonded by monetary contracts or enforced by professional hierarchies, you have to work extremely hard and be driven and passionate so as to attract their attention and to deserve their time and effort.

The reward for the mentor is not money or promotions at work, but seeing the result—seeing they can make a difference in your progress.

To get the best out of a mentoring or coaching relationship, you first need to know how to listen to advice. Like in any communication, effective listening requires you to give up any prejudgment of what you hear.

The most damaging prejudgment is not about deciding if the advice is right or wrong, or whether or not to take the advice, but telling yourself, “I know this already.”

When you think “I know this already,” you quickly determine that this advice, though valid, is of no new value, therefore quickly brush it aside and take no action.

Often, when great advice motivates you to take the right action and it yields the right result, it is not because it is new advice; you may have heard it many times before. Following that advice worked only when it clicked with you, when you really listened, were more capable of understanding the advice, and you thought, “Why didn’t I take action earlier?”

The best advice is not the new suggestion, but the suggestion you listen to and take action on. Listen to every piece of familiar advice like it is new advice. Instead of thinking “I know,” ask yourself, “Have I mastered it? Have I seen the result?” If the answer is no, make a plan and take action.
Become Your Own Mentor

Shortening your learning path is normally the reason to seek out a mentor in the first place. The most important role a mentor plays is in motivating you to reach higher goals—goals that you might have thought impossible when you first sought help from your mentor.

It is also important not to rely on professional help as a crutch forever. The goal of seeking professional help is to shorten your learning path, to become independent and competent faster.

When you are on the real battlefield, no one can do your work for you; you have to do it for yourself. You cannot go far if you have to rely solely on external motivation.

Ultimately, you have to learn to be your own motivator.

Seeking help and finding mentors is an important strategy for getting where you want to go in your career. Learning to listen to advice and keeping an open mind to recognize those around you who can serve the role of mentor will broaden the opportunities you have for learning.

While self-teaching is an important practice and can go a long way to helping you learn basic skills, coaches will know what you need, even what you do not.

ABOUT THE AUTHOR:
Lei Wang is an internationally-recognized adventurer, motivational speaker and author of After the Summit: New Rules for Reaching Your Peak Potential in Your Career and Life. The first Asian woman to complete Explorers Grand Slam (climb the highest peak on each continent and ski to both poles), Lei channels her experiences to convey a message of perseverance and steadfast determination that her audiences can use at work or at home. For more information about Lei Wang, please visit www.JourneyWithLei.com.
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Imagery and GIS: Best Practices for Extracting Information from Imagery
Kass Green, Russell G Congalton and Mark Tukman
ESRI Press, 2017

Review by Greg Newkirk, GISP AICP

This book is the latest addition to the growing library of books that show how to convert imagery into analytical products useful in GIS. It is comprehensive in its approach and offers itself as a foundational resource for understanding and working with imagery as it is converted into GIS layers.

Section 1 introduces the book by describing the wonder of imagery and its symbiosis with GIS. Its stated purpose is to provide the reader with “knowledge required to make informed decisions about imagery…[providing] a decision framework for all…work with imagery.” Their style of writing is clear and precise, using both simple and complex drawings to explain technical concepts. The reading level (outside of technical terms and concepts) is enjoyable and easily understandable.

The chapter on imagery fundamentals is an excellent presentation on the basics of remote sensing. It provides clear and simple explanations of platforms, sensors (both passive and active), the physics of imagery along with levels and types of resolution. The drawings used to depict various concepts are new, the artistry is excellent and as a result of its simplicity transmits understanding with great clarity. This chapter is a must read for anyone needing a review of remote sensing, especially those who struggled from the technobabble of past college textbooks. It also qualifies as a primer for anyone needing an introduction to the science and technology of remote sensing. The following chapter on choosing the right imagery is a bit more challenging since it is full of questions and tables. Needless to say it requires much more thought and consideration for the many details that are covered.

Section 2 continues with the fundamentals of remote sensing, including such items as scale, compression, pyramids, histograms, filters, mosaics and sources for obtaining imagery. It also reviews the basics of image correction for problems related to spectral interference and geometric challenges including orthorectification and mosaicking.

Section 3 shows the reader how to extract information from imagery. The authors begin by imposing a little discipline regarding minimum mapping units and classification schemes. They then provide an extremely elaborate example for Sonoma County. This is followed by a short chapter on digital elevation models, lucidly covering terms such as DEM, DSM, DTM and DHM that tend to be a bit confusing. For this reason, the reader will love figures 8.1 and especially 8.2 which identify exactly what each acronym represents. The authors then remind us that photogrammetry is still very relevant given the advent of UAS technology. Its use of high-resolution imagery is able to produce high-resolution DEMs along with all of their derivatives such as contours, hillshades and so on.

The chapter on data exploration begins with an in-depth examination of the field of remote sensing. As always, the authors continue to write with clarity and beautifully simple images. This is especially helpful as the material becomes more complex in the following chapters on image classification and change detection.

Section 4 contains essential material regarding data housekeeping. Unfortunately, it is placed in a rather anti-climactic position which forces the reader to push on to finish the book. The capstone chapter entitled “Concluding Thoughts,” provides a brief review and offers what the authors call nuggets of wisdom. Some of these nuggets are simply some good things to keep in mind, while others may make the difference in a project’s success. They sound like hard-learned lessons.

This book is a successful collaboration between the authors, their colleagues and the professional writing staff at ESRI. It stands as an excellent resource for understanding the full range of issues regarding the conversion of imagery into useable GIS layers. More than this, it stands as one of the best examples of how a technical book should be written due to the extent of its remarkable clarity.
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GeoTechVision

With offices in Kingston, Jamaica (876-970-5686) and Georgetown, Guyana (592-227-0433) www.geotechvision.com

GeoTechVision focuses on “Delivering Value through Innovative Solutions!” We have been assisting Caribbean Businesses, Agencies and Government Ministries to develop and effectively use spatial intelligence in critical decision making! We are very involved with establishing Geographic Information Systems, GPS and Mobility products and solutions, as well as marketing our own “Geo” brand tablet. We consider Human Capacity Building as very critical - right from the classroom to the work environment. Hence our Classroom Management Solution and our strong focus on Training and Development in all our engagements. Our other consulting services include Project Management, Information Security Advisory, Process Audit and Assurance, Business Analysis and Enterprise GIS solution planning and implementation.

Infrastructure Mapping and Autonomy

We leverage technology developed by our autonomous vehicle mapping partner for rapid LiDAR processing and map production.

Infrastructure Mapping and Autonomy was created out of the Heavy Industry of Civil Maps an industry-leading artificial intelligence company, providing LiDAR processing and feature extraction services. Our technology was first developed to meet the high accuracy, 3D mapping needs of the autonomous vehicle industry. IMA is now bringing this technology to the engineering and infrastructure industries.
Our technology allows us to scan, map and report on assets or asset areas at a rapid pace and affordable cost not possible before. Leveraging our proprietary artificial intelligence, patented cloud based processing technology, and global relationships for LiDAR collection and processing and quality control, we can generate data sets, models and change detection reports 10x faster than with traditional methods.

By creating HD 3D maps in the earliest stages of projects, our clients are able to increase the NVP of projects by lowering the time to completion and reducing and deferring survey programs until the later stages of a project. Additionally, clients with existing assets to manage benefit from our centralized on-line business-to-business services to manage their rapid feature extraction and mapping programs. Eliminating the inefficient traditional person to person sales and manual data handling processes. Our al-a-carte on-line tools allow asset owners to individually direct and manage their mapping projects, resulting in quicker turnaround times and lower costs overall.

**MGP**

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MGP is an information systems services company that specializes in geo-spatial solutions. Our comprehensive range of geographic, data modeling, and business process solutions provide you new opportunities to find a better way. We believe that innovation creates opportunity and collaboration breeds success. MGP was formed as a shared business model in which clients are partners. This philosophy enables significant cost savings and makes it possible for any client, regardless of size, to get where they need to go. MGP is the managing partner of the GIS Consortium.

**Planning Communities, LLC**

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Planning Communities, LLC provides a wide range of multi-disciplinary planning services for local, state and federal agencies, tribal nations and community organizations. Community, transportation, environmental and GIS services include local/regional planning, visioning/ scenario planning, land use, socioeconomic, market and cost-benefit analysis, community asset mapping, tool/ application support and development, process improvement/ integration, consensus-building and facilitation.

Headquartered in Raleigh, North Carolina, Planning Communities has additional offices in Charlotte (NC) and Seattle (WA). Planning Communities is a North Carolina certified Small Professional Service Firm (SPSF) and is certified as a DBE in North Carolina, Tennessee, Florida and Delaware.

**Solv3D, Inc.**

Solv3D creates tools that enable people to effectively use large 3D point clouds and immersive imagery within their existing workflows. Using the 3DPointLogic™ toolkit, individuals can easily turn massive point clouds into manageable data sets. With the SiteVisit360™ collaborative platform, companies can merge 3D point cloud data, panoramic imagery and other photography, resulting in a virtual project environment, allowing them to more effectively leverage the value of their datasets for estimation, planning, design, and decision-making.

**Spatial Relationships, LLC**

Spatial Relationships, LLC is a consulting firm that provides on-demand teams of expert Geospatial Professionals to ensure organizations have the capability to deliver on existing and future goals, manage business risk, and increase profitability.

Think of us as your geospatial concierge. Our “concierge services” provide resources and solutions for planned or abrupt disruptions as well as future projects. These can include:

- **Being a key person down** – planned leave or unexpected departure
- **Technical requirements** – fill skills, knowledge and training gaps
- **Budget constraints** – less than anticipated funds for the same scope of work
- **Capacity constraints** – completing urgent priorities for overbooked staff

Spatial Relationships, LLC was born out of the necessity to create new flexible and affordable ways to work that support organizations to manage ever-increasing demands as well as the need to support the community of Geospatial Professionals.

**Synergy Systems & Services**

Synergy is an Asian American owned MBE with an excellent track record of government contracting. Established 2002 and based in Maryland we have come a long way from providing data support services at Maryland State Highway Administration to providing services such as Database Management, GIS Data Creation, GIS application development and support, Software Engineering and Business Process Consulting to its distinguished clients in various Government Agencies. We take pride in all our work and take every effort to ensure the satisfaction of our clients.
Temporal Geo Analytics
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info@TGAmaps.com

Temporal Geo Analytics, Inc. (TGA) is a Land Use and Environmental Litigation consulting firm. We have expertise in using Geographic Information Systems (GIS) to develop, manage, and distribute complex spatial databases, as well as creating the presentation-quality visualizations and graphics needed for natural resource litigation and land use projects.

TGA specializes in the analysis of multifaceted land use issues and environmental impacts over time. TGA is expert at acquiring and integrating historic and current spatial data to build the critical information you need to represent your case.

Using GIS, we transform complex issues into defensible, authoritative, and easily understood maps and graphics. Our clientele consists primarily of natural resource and environmental attorneys, oil and gas companies, mining companies, and land developers.

Leveraging GIS for Environmental, Natural Resource, and Land Use Planning is our core expertise. Geographic Information Systems (GIS) integrate and overlay unlimited layers of themed spatial and tabular data to illustrate and reveal patterns, context, and the intrinsic qualities of any location. A GIS is also a powerful analysis tool capable of querying data for location and its relationship to overall context. At TGA, we have an intimate understanding of these tools and their capabilities.

Working with you and other experts, we build a completely defensible, dynamic analysis data platform with interactive visualizations and related tables that clearly represent the qualities of your project and its relationship to larger political, environmental, and regional contexts.

USC Spatial Sciences Institute
Since its founding in 2010, the USC Spatial Sciences Institute has been using the power of spatial thinking and literacy — the ability to connect place and space — to help address global challenges, including those connected with population growth, urbanization, environmental sustainability, and human well-being. Through its innovative academic programs, the Spatial Sciences Institute educates and trains today's leaders capable of deploying the “science of where” in every possible discipline and industry. Members of our internationally-recognized faculty contribute to the rapidly-evolving body of geospatial knowledge. From our home base in the USC Dornsife College of Letters, Arts and Sciences, we collaborate with faculty colleagues throughout the University of Southern California and with other prestigious institutions around the world on funded research that links SSI faculty and students with decision makers and citizens and knowledge with action. We promote the analysis, modeling, and visualization of location-based data through interdisciplinary use-inspired and integrated research and teaching.

Roster of Academic Programs:
• B.S. in GeoDesign
• Spatial Studies minor
• Human Security and Geospatial Intelligence minor
• Online Graduate Programs in Geographic Information Science and Technology
• Graduate Certificate in Geographic Information Science and Technology
• Graduate Certificate in Geospatial Leadership
• Graduate Certificate in Geospatial Intelligence
• M.S. in Geographic Information Science and Technology

Temple University, Fox School of Business - Philadelphia, PA
Increase your capabilities with the Fox Master of Science in IT Auditing and Cyber Security and gain the knowledge to assess and control organizational cyber risks and protect data and information assets. Learn from experts in the field through our industry-proven curriculum, featuring built-in preparation for Certified Information Systems Auditor (CISA) or Certified Information Systems Security Professional (CISSP) certification. Flexible class formats enable you to choose the option that works best for you: online, face-to-face, or a hybrid of both.
• Master of Science in IT Auditing and Cyber Security
• Graduate Certificate in IT Auditing and Cyber Security

North Carolina State University - Center for Geospatial Analysis
• Master of Geospatial Information Science and Technology (MGIST)
• Graduate Certificate in Geospatial Information Science (GIS)

Auburn University
• Bachelor of Science in Geographic Information Systems
• Master of Science in Geographic Information Systems

Lakeland Community College — Kirtland, OH
• Geography and Geospatial Technology - Associate of Applied Science and certificate programs

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URISA members, remember that URISA will distribute your RFP/RFQ announcements to our corporate and business members at no charge. Simply email your announcement to info@urisa.org (Subject: RFP Service) and we’ll send it right out for you!
Mark Your Calendar!

March 19-22, 2018
2018 GIS/CAMA Technologies Conference
Houston, Texas

April 9-13, 2018
URISA GIS Leadership Academy
Columbus, Ohio

July 23-27, 2018
URISA GIS Leadership Academy
Salt Lake City, Utah

October 9-12, 2018
GIS-Pro & CalGIS 2018
Palm Springs, California

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Save the Date!