How to Become a GIS Software Engineer

There are several different software packages that are used in GIS applications. The software must edit, analyze, and give location to all the attribute data. There is also GIS software that is specialized for web applications such as serving data through an internet browser program. Employment as a GIS engineer requires you to have a thorough understanding of the major software packages used in GIS applications. Additionally, to be a successful GIS software engineer, you have to learn to do numerous tasks, such as:

- Read and use a Geoprocessor Object Model Diagram
- Fetch and create messages from the geoprocessor
- Acquire descriptive information about your particular GIS data
- Insert, update, and delete data from the GIS data files
- Read and write feature geometry
- Make lists of data for geoprocessing
- Write custom script tools

Clearly, GIS software is more specialized than general programming. GIS resources are used in a huge range of applications, from banking to marketing to medical applications. Because a GIS is made to display data in many different forms, a GIS software programmer is needed to make readable maps incorporating the necessary information. Here are the general steps to take toward becoming a GIS software engineer.

Education

The best education for a GIS software engineer to have is a four-year college degree in computer software engineering. A degree that has an emphasis on programming and database development is best. To prepare for the variety of tasks that a GIS software engineer will be called upon to do, an aspiring GIS software engineer should learn a broad mix of programs, such as Oracle Spatial and ArcGIS, along with fundamentals of geography and engineering.

Certification

Once you have the education to be a GIS software engineer, your next steps are pursuing relevant employment and earning GIS certification. To enroll in a certification program, such as the one developed by the GIS Certification Institute (GISCI), you need a four year degree plus relevant experience teaching or collecting data. Enrollment for certification can be done online.

Continuing Education

Because of the rapidly changing nature of technology, your education as a GIS software engineer will continue to evolve over the years, as will your career. Continuing education ensures that your skills are up to date and that you're qualified for the most GIS software engineering careers as possible. Continuing education along with GIS certification with the GISCI will help you keep your edge when applying for more senior level GIS software engineering jobs.

Most Common Environments for GIS Software Engineers

While GIS is certainly expanding into a variety of fields, GIS employment is still the most concentrated in a few areas. Government agencies on any level that handle urban planning have a high need for GIS software engineers. Weather organizations also use GIS data extensively for understanding climate issues, and state wildlife agencies use GIS applications to map out conservation strategies and wildlife habitats. Military use of GIS applications is also strong.

Careers in GIS: General Tips

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To have the most marketable GIS software engineering skills, you need to have excellent problem solving and analytical skills. On top of this and your education, being a GIS engineer requires a certain amount of creativity too. The expansion of GIS uses depends on GIS professionals who are able to envision new applications for GIS technology and then see them through to reality. It is important to know that some GIS jobs are contract jobs for certain time periods. This can be great for the freelance GIS software engineer, but those who envision more long-term or stable careers should ideally pursue government and military jobs.

Becoming a GIS software engineer is a more specialized process than becoming a general programmer in that it involves the knowledge and use of geographical concepts as well as cartography (map making) knowledge. Employment as a GIS software engineer should continue to grow as GIS technologies are used by more and more sectors of the economy. For the person interested in making data accessible and meaningful through spatial representation on maps, careers in GIS programming can be ideal.