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# Polyglot Programming with the OpenEye Toolkits

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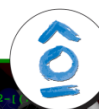


- 1960's
  - FORTRAN or COBOL
- 1970's
  - FORTRAN or C
- 1980's
  - FORTRAN or C or C++
- 1990's
  - C or C++ or Java



# Polyglot programming

- Use of multiple languages to solve a problem
- Use the right tool for the job
- 1,080,000 Google hits for the term “polyglot programming.”



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Most already do this

- Bash/CSH scripting
- Perl
- LaTeX
- HTML/Javascript
- R
- Matlab



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# What do we have today

- C++
- Python (CPython)
  - Written in C and compiled for each OS/Platform
- Java (JVM)



- Enterprise/IT tends to choose Java or .Net
- Fit that need while providing the (hopefully) last platform for OpenEye Toolkits
- Help get IT using the same tools as science
  - Too many IT groups re-write PDB file readers in Visual Basic



- The Virtual Machine as the Platform
- JVM – Java Virtual Machine
- CLI – Common Language Infrastructure
  - CLR – Microsoft's Implementation (.Net)
  - Mono – Open Implementation (OS X and Linux)



- JVM-based languages
  - Java
  - Groovy
    - Extension of Java syntax
    - Scripting language
  - Jython
    - Complete implementation of Python on JVM
  - JRuby
    - JRuby on Rails web framework
  - Scala
    - Functional programming on the JVM



- CLI/.Net languages
  - C#
  - F#
    - Functional programming with objects
  - Visual Basic
    - Still a lot of use in IT
  - IronPython
  - IronRuby



- Extending Python with C++
  - Try out an algorithm in Python
  - Port to C++
  - Wrap in Python
    - Use SWIG
    - Link to same OE libraries
    - Use alongside out Python toolkits



- JVM languages work now
- CLR/.Net
  - Beta in April
  - Mono depends on interest
  - Full support as part of next toolkit release
- Writing your own C++ extensions to Python
  - Full support in next toolkit release.
- Example code available
  - F#, Scala, JRuby, IronPython



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