

# **Excellence in Computer Programming**

**ECP**

**A Unique Opportunity for  
South Dakota**

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**[www.codewf.org](http://www.codewf.org)**

# Challenges and Opportunities

- Computers have changed life for the world
  - We have access to instant information
  - We easily share our trusted thoughts
  - We believe computer systems are secure
- Now we have to defend against cyber attacks
- Our adversaries are able to breach our defenses and steal information

# Cyber Attack – How Can it Happen?

- Computer systems typically have:
  - Powerful programs for processing data
  - Large amounts of data such as credit cards, personnel records, or corporate information
- We fix system problems with upgrades
- Adversaries search to find an entry point and acquire data
- Cyber defense - build code without problems

# Cyber Attacks - The Result

- Cyber attacks up 40% in 2014 as reported by Time Magazine
- The result—the loss of valuable information
  - Employee personal information
  - Credit cards and accounts
  - Intellectual property
  - Technology
- Some Examples:

# Target - 110M Consumers - \$148 M



# J.P. Morgan Chase - 76 M Households



# Home Depot -60 Million Cards



# Hollywood Celebrities





# Eight Months Undetected



# Preparing America's Coders

- Coders prepare the processes for computer systems to solve problems
- The experience of coders determine the quality of computer operations
- The best coders have great experience gained by solving a board range of problems

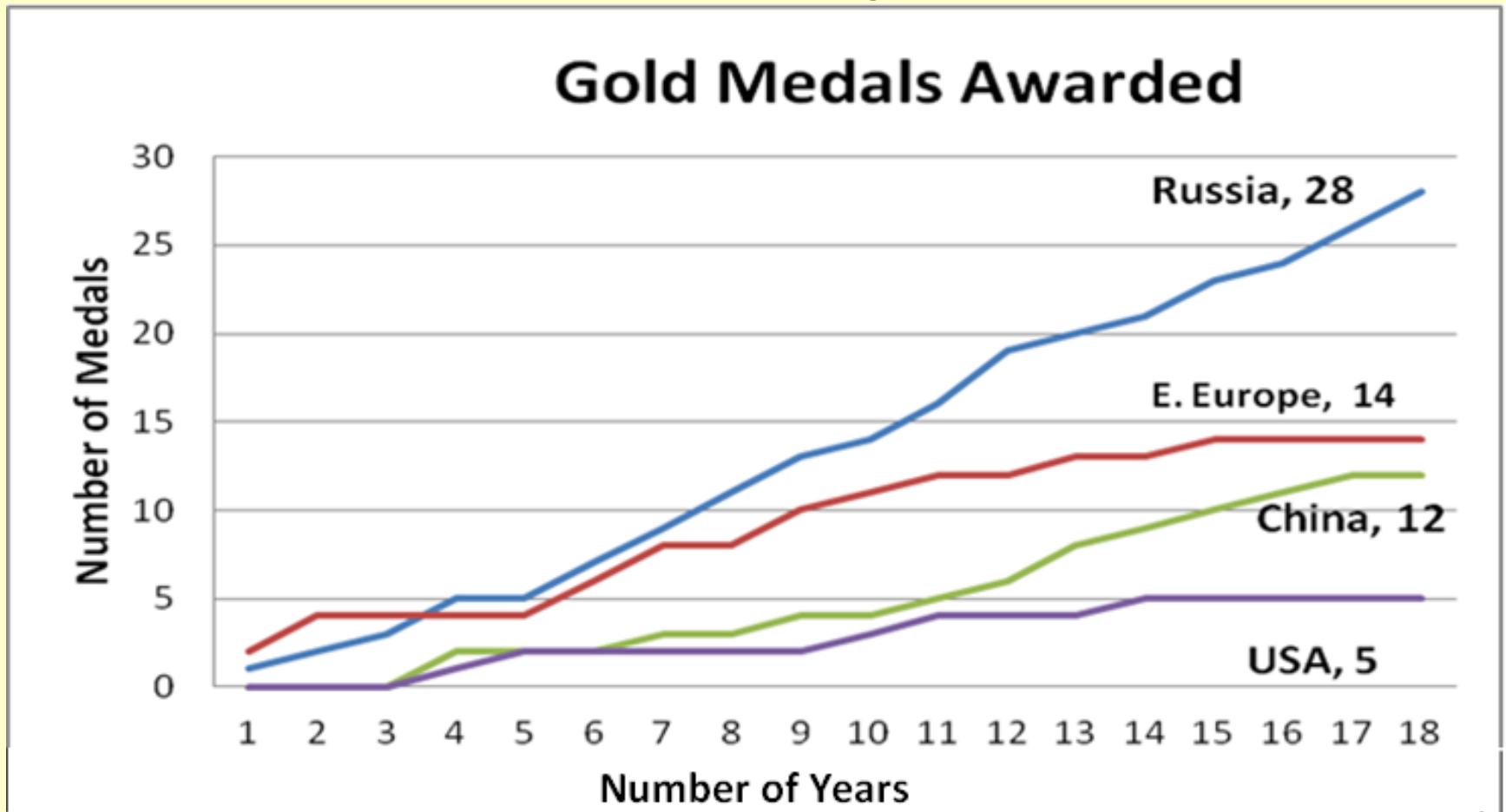
# How do American Coders Compare

- One comparison of the best coders is the number of gold medals awarded to the top four places in the ICPC World Finals



# Value of Experience in Coding

In 18 years, Russia was awarded 28 gold medals and America was awarded 5 gold medals



# Preparing America's Coders

- America: K-12 education does not include coding
- Others: High priority on coders becoming proficient as part of basic education
- America: Proficiency in sports and music are developed outside of K-12 education
- Prepare proficient coders with processes similar to sports and music

# A Unique Opportunity

- For South Dakota:
  - To lead the development of the new direction for preparing a coding workforce
- Give a new emphasis to:
  - Prepare South Dakotans to be world's best coders for American industry
  - A learning environment similar to sports
  - The importance of proficiency

# A New Direction in Coding

- Resources for coding workforce are available
- A team of teachers identified excellent resources to prepare the coding workforce
- The teachers report provides Internet access to:
  - Resources for teachers, parents, and students
  - An environment to learn to code
  - Websites to demonstrate proficiency
- Go to [Codewf.org](http://Codewf.org) to obtain the report

# A New Direction in Coding

- Integrate coding resources of K-12 schools, technical institutes, and universities, particularly SDSMT and DSU
- Develop coding modules available by distance delivery to serve both students and adults
- Provide individualized code learning for participants
- Team competitions with mentors, coaches, and the recognition of achievement



# Join The Computing World

- Host the International Collegiate Programming Contest World Finals
  - Annual Olympic style competition
  - Fall: 2,600 universities with 250,000 computer science majors competing to be the winners
  - Spring: 130 universities will be in the World Finals in Rapid City in May 2017
- An unusual opportunity to globally market South Dakota and the coding workforce



# ICPC World Finals



# Winners of the ICPC World Finals



# What's Next – Coding Workforce

- Implement a pilot of the South Dakota Coding Workforce
  - New direction for coder education
  - Integrate excellent available coding resources
  - Environment with teams of coders similar to sports
- Fund Pilot for \$100,000 in 2016
  - Prepare coding educational materials
  - Prepare Wiki for Internet operation

# What's Next - ICPC

- Bring ICPC 2017 to South Dakota
  - ICPC leadership has chosen Rapid City for 2017
  - Fund South Dakota portion - 2017 World Finals
- Funding Goal for South Dakota
  - \$600,000 before January 15, 2016
  - \$200,000 already pledged
- Value to South Dakota
  - Featured global marketing 2016-2017
  - Provide a new direction for coding education