# Dr. Peter Capak

https://www.linkedin.com/in/peter-capak/

## Summary

Demonstrated leadership and extensive expertise in Research and Development, Machine Learning, Statistics, Project Management, and Systems Engineering. Has worked at the junction of hardware, software, and human factors in projects with budgets up to $4.5 billion. Has a strong track record of delivering software and hardware systems, requiring significant R&D, on deadline and budget. Over 15 years of experience recruiting, leading, and mentoring international cross-functional teams of scientists, hardware engineers and software engineers to develop cutting edge systems including products. Recognized for effectiveness in managing and negotiating international partnerships between industry, academia, and governments.

## Work History

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| April 2020 – Present | Architect of Perception Systems for Augmented and Virtual Reality, Facebook/Oculus |
| June 2004 – Present | Project Lead and Scientist, California Institute of Technology (Caltech) and NASA Jet Propulsion Laboratory (JPL), Pasadena, CA |

## Skills & Expertise

**Systems Engineering:** Has been part of the leadership for several international teams that designed and developed complex systems including hardware, software, and human factors. The projects tackled by these teams include scientific satellites, IT systems, technical user-interface (UI) systems, and focused technical projects with total budgets of up to $4.5 billion. One example is the ESA/NASA Euclid mission. Has extensive experience setting up requirements matrixes, accountability systems, and management structures for trans-national, multi-organizational projects that include government, industry, and academic partners.

**Research and Development (R&D) Management:** Has successfully lead both focused small groups and large international cross-functional teams of independent researchers to develop leading edge scientific breakthroughs. Has authored over 300 research papers in Astrophysics, Physics, Machine Learning/AI, material science, and detector/instrument development including four in Nature. Is one of the top 1% of cited researchers in space sciences and has successfully proposed for over $300 million in US and foreign government grants.

**AI and Machine Learning (ML):** Has developed and combined AI/ML techniques that use domain knowledge, Bayesian statistical methods, and existing AI/ML to extract information from complex and large high-dimensional and multi-spectral imaging data sets.

**Mentoring and Recruitment:** Has recruited, retained, and mentored high-performing and diverse talent for national and international organizations focused on engineering and R&D. Maintains a deep and diverse cross industry network of talent. Exceptional track record of increasing gender balance and overall diversity in both functional and leadership teams.

## Skills & Expertise (Continued)

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**Project Management:** Has successfully led cross-functional teams including scientists, educators, software and hardware engineers to deliver products, such as space flight ground systems, on deadline and budget. Has written requirements and goal driven risk management plans to guide the development of R&D projects with fixed deadlines, budgets, and requirements.

**Risk and Cost Management:** Has designed cost and time risk management models for complex systems that require development of significant new technology such as the NASA SPHEREx mission. Then has shared these models with decision makers and review boards to assist them in making risk/reward decisions.

**Program Evaluation:** Extensive experience presenting to, and serving on review boards to evaluate project progress, risk, and cost. Has developed evaluation criteria and evaluation plans for R&D, IT, and educational projects.

**Technical Communications:** Recognized for his strength in presenting complex technical topics to a range of audiences including domain experts, managers, executives, external review boards, and elected officials. Recent examples include being the California representative at the congressional day for the NASA WFIRST mission which successfully lobbied for $520 million in additional FY2020 funding.

**Customer Relations and Service:** Managed the development of user interfaces and supporting IT systems to display, visualize, and analyze complex multi-petabyte databases. Customized the interfaces and functionality based on user feedback and testing. Developed requirements and development priorities based on a combination of cost, risk, and stakeholder input. One example of a complex interface worked on is the NASA/IPAC IRSA service.

**Software Development:** Has lead international teams of developers working with domain specialists to develop complex image and other data processing systems such as the pipeline for the NASA Spitzer and ESA/NASA Euclid missions along with UI interfaces for specialized databases.

**Hardware Development**: Has served as a leader or key team member in the development of projects ranging from material science-based detector development requiring customized silicon lithography and atomic layer deposition to large-scale instrument and spacecraft development requiring a range of engineering domains. An example is leading the JPL focal plane and detector development team for the Canadian Space Agency CASTOR mission.

## Education

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| 2004 | Ph.D. in Astrophysics, University of Hawaii at Manoa |
| 2002 | M.Sc. in Astronomy, University of Hawaii at Manoa |
| 1999 | B.Sc. with Honors in Physics and Astronomy, University of British Columbia |