

# James Tompkin | Teaching Statement

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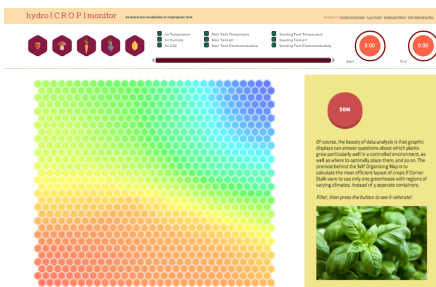
I want to empower students with theory and practice, to instill an attitude of critical assessment, and to nurture a creative perspective for the future. To this end, I have co-taught large undergraduate and small graduate courses, mentored PhD and MSc students, led a research subgroup, engaged the wider community with a conference course, reached out to the public in exhibitions, and helped build a future online learning platform.

**In the classroom** At Harvard, I help teach *Visualization* to 200+ college and distance-learning students. Introducing Web programming, interaction, and design to a diverse student body is challenging. For technical skills, I hold tutorials and office hours with group coding sessions, where I use real world context to motivate concepts. For design skills, I facilitate discussion of case studies and peer-review of solutions. I help write and grade courseworks, write back-end management systems, and respond to forum and live lecture questions online. Without a programming background, this can be an intimidating course. I remedy this by engaging students with questions to build their confidence, by being approachable and accessible, and with personal warmth and enthusiasm.

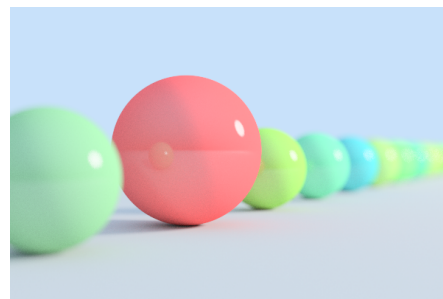
At Max-Planck-Institute for Informatics, I co-lectured the graduate seminar *Computer Vision for Computer Graphics*. I helped set the course curriculum, developed and ran assessment, and managed the day-to-day activities of the class. As a discussion-based experience spurred by my questions, students critically assessed state-of-the-art works to learn fundamental techniques and to prepare them for their own research. As the technical level was high, I took extra time to identify struggling students and find them ways of working which would lead to a good chance of success.

At University College London, as the teaching fellow for the graduate *Advanced Modeling, Rendering, and Animation* course for four years, I developed engaging courseworks which conveyed core ideas to all students, then gave scope to gifted students to explore advanced topics with a rendering competition. As co-lecturer for the undergraduate *Multimedia Computing* course for three years, I explained state-of-the-art video systems. As students had diverse computer science, architecture, arts, and humanities backgrounds, I used metaphors from familiar domains as alternative explanations. I integrated the surrounding current affairs, business, and politics, such as privacy and media rights, to provide context and motivation.

**One to one** During the sabbatical of Prof. Pfister at Harvard, I was trusted to lead the graphics and vision subgroup of his lab. This involved supervising three PhD students in computational design, interactive machine learning, and large-scale biological imaging. At Max-Planck-Institute, I co-supervised one PhD student and two visiting PhD students from India.



Supervising students to a prize-winning project during the *Visualization* course at Harvard. *hydro[CROP]monitor* optimizes crop layout using self-organizing maps to visualize better space management in hydroponic container farms. *Spyridon Ampanavos and Tiffany Cheng.*



Student results from my rendering competition on path tracing, during teaching of *Advanced Modeling, Rendering, and Animation* at UCL. This included concepts such as depth of field and glossy reflection. *Long Nguyen.*

During my EngD at University College London, I co-supervised four MSc students, and enabled and supported the theses of two undergraduates and three MSc students with my research into multi-touch hardware and software. Collectively, these led to eight conference and journal publications.

**Off campus** I engage the public in exhibitions and gain new perspectives for teaching. I collaborated with architects on new interactive hardware for innovative space visualization, This was the centerpiece of a three-month show at The Building Centre in London. With film-maker Jeff Desom, our *Rear Window Augmented* piece highlights how research can bring new perspectives to art. Having shown twice in Europe, it is currently installed for six months at the Museum of the Moving Image in New York City.

Further, I developed and taught a course with colleagues on *User-centric Computational Videography* at ACM SIGGRAPH 2015, which was peer-reviewed for inclusion. As the audience of academics and graphics professionals had different knowledges, I traded depth and breadth in designing the module, which was described as “inspiring” by attendees afterwards.

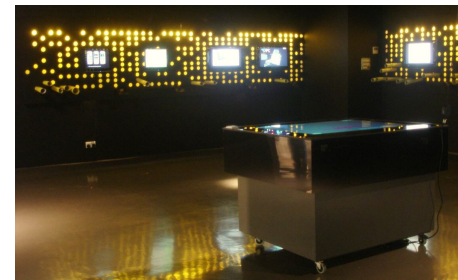
**Online** Working with HarvardX, an early pioneer in massive open online courses, and with Prof. Gary King of the Harvard Institute for Quantitative Social Science, I help build a new platform for future Harvard University and HarvardX courses. This combines linear curated learning, as in a classroom course, with non-linear personalized learning, as in an online course, within a coherent interactive visual representation. We will launch the first course on this platform in spring 2016, to validate the education benefit of this new approach.

**Next steps** Teaching is a skill that must be developed, and I am keen to learn from the experience of my colleagues and students and from alternative teaching methods. From my exposure at Harvard, I am eager to use flipped classroom techniques, in combination with my work on online learning platforms, to give students the most in-person support at the point of information assimilation rather than at the point of information transfer. Having visited Harvard Business School, I also wish to try applying case method techniques to provide context to advanced problems and allow students to discover existing outcomes for themselves. I am also aware that progress in attracting women and minorities to computing can be furthered by adopting teaching methods which are more inclusive, such as contextualized and project-oriented learning, and pair programming.

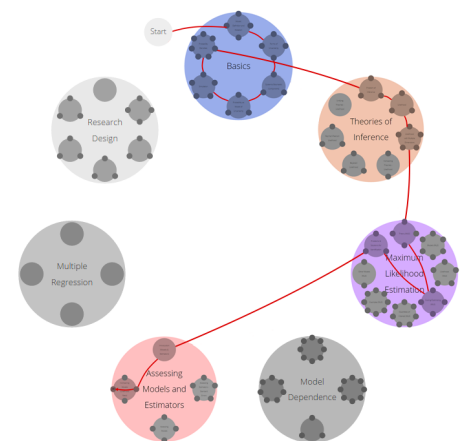
I would be happy to teach undergraduate courses, especially in visual computing: e.g., in graphics, vision, image processing, or multimedia. I have good knowledge of the wider world of visual computing, including games, visual effects, virtual reality, visualization, HCI, and computational design and fabrication. I would be pleased to teach state-of-the-art topics to graduates, such as computational photography, cameras, and displays, advanced image/video processing, or vision for interactive graphics.



*Rear Window Augmented* shows how technology developed during research can create new artistic interpretations of media. Photograph courtesy of Kevin Hagen and *The Wall Street Journal*.



Interactive space visualizations developed in collaboration with architects at The Bartlett were presented on my multi-touch table at The Building Centre in London in 2008.



*HarvardX*: A hierarchical map of learning concepts is arranged so that linearly taught material runs around the outside of the circle, but non-linear paths cut inside the circle. The red line shows an automatically-created path based on dependency and student progression.