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Collaborative web-based annotation of video footage of deep-sea life, ecosystems and geological processes

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More and more seagoing scientific expeditions use video-controlled research platforms such as Remote Operating Vehicles (ROV), Autonomous Underwater Vehicles (AUV), and towed camera systems. These produce many hours of video material which contains detailed and scientifically highly valuable footage of the biological, chemical, geological, and physical aspects of the oceans. Many of the videos contain unique observations of unknown life-forms which are rare, and which cannot be sampled and studied otherwise. To make such video material online accessible and to create a collaborative annotation environment the "Video Annotation and processing platform" (V-App) was developed. A first solely web-based installation for ROV videos is setup at the German Center for Marine Environmental Sciences (available at http://videolib.marum.de). It allows users to search and watch videos with a standard web browser based on the HTML5 standard. Moreover, V-App implements social web technologies allowing a distributed world-wide scientific community to collaboratively annotate videos anywhere at any time. It has several features fully implemented among which are:

• User login system for fine grained permission and access control
• Video watching
• Video search using keywords, geographic position, depth and time range and any combination thereof
• Video annotation organised in themes (tracks) such as biology and geology among others in standard or full screen mode
• Annotation keyword management: Administrative users can add, delete, and update single keywords for annotation or upload sets of keywords from Excel-sheets
• Download of products for scientific use

This unique web application system helps making costly ROV videos online available (estimated cost range between 5.000 – 10.000 Euros per hour depending on the combination of ship and ROV). Moreover, with this system each expert annotation adds instantaneous available and valuable knowledge to otherwise uncharted material.